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Costs and Finance of Higher Education in Pakistan

Rosemary Bellew
and
Joseph DeStefano

Available educational resources could be used more effectively by reducing the proportion of nonteaching employees — most of them servants — and by reallocating those resources to faculty and instructional materials. Pakistan's government should not allocate more resources to the sector until it has established better mechanisms for allocating resources and has established incentives and sanctions to improve institutional performance.

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This paper — a product of the Education and Employment Division, Population and Human Resources Department — is part of a larger World Bank sector study on higher education in Pakistan. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Cynthia Cristobal, room S6-214, extension 33640 (57 pages, with figures and tables).

Using data from colleges and universities, Bellew and DeStefano investigate the costs and effectiveness of higher education in Pakistan, identify factors that influence those costs and effectiveness, and estimate levels of study subsidies.

Not surprisingly, they find that most colleges and universities are underfunded. They operate with minimal faculty, spend little on learning materials, and cannot cut costs by enrolling more students (with current faculty levels) without jeopardizing the quality of education.

Available resources could be used more effectively by reducing the proportion of nonteaching employees — most of them servants — and by reallocating those resources to faculty and instructional materials.

Student performance in examinations is consistent with the level and use of resources. Most students fail examinations, particularly in crowded institutions that offer few courses. And those who pass do so largely through their own efforts, not because of the quality of teaching.

There are no institutional incentives for achievement or penalties for failure. Colleges and universities are not held accountable for the quality of instruction, cost recovery is low, and the government demands no standards. It would be imprudent for the Pakistani government to allocate more resources to the education sector until mechanisms have been established for more effectively allocating resources within and among institutions and for establishing incentives and sanctions that create pressure to improve institutional performance.

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This analysis was a part of a larger World Bank sector study on Higher Education in Pakistan. Ralph Harbison supervised the study and many Pakistani Higher Education authorities provided data, as well as their time and insights. The paper also benefited from the comments and support of Charles Benson, John Middleton, Bashir Parvez, and Adriaan Verspoor. Nasir Jalil contributed to organizing the information in the early stages of the study.

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COSTS AND FINANCE OF HIGHER EDUCATION IN PAKISTAN

Introduction

Recent studies on higher education in developing countries have concluded that the expansion of higher education over past decades has outstripped developing countries' financial and management capacities, resulting in low quality teaching, learning and research. Low quality is reflected in a decline in unit expenditure, a shift of recurrent expenditures to salaries, and shortages of equipment and materials. At the same time, available resources are often inefficiently used, supporting high cost small universities and under-enrolled specialized programs, underutilized facilities and faculty, and high ratios of nonteaching to teaching staff. Inefficient finance mechanisms, poor monitoring and accounting systems, and an absence of performance objectives and measures also makes it difficult to hold institutions accountable for expenditures and outputs. Given these circumstances, it is often concluded that in order to improve quality and the financial sustainability of the system, countries should alter planning, financing, monitoring, and governance practices.[1]

The empirical base to substantiate this description of higher education in developing countries is narrow, however, and generally limited to anecdotal evidence or to cross-country data aggregated at the national level. Institutional level data on enrollment, costs and quality are not usually available. Therefore, little is known about the costs of higher education and how they vary across institutions and programs, about the effectiveness of colleges and universities and the institutional characteristics related to their effectiveness, or about variations in revenue and levels of cost recovery. This exploratory analysis attempts to bridge that gap by describing

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[1] See, for example, World Bank 1986a, 1988a, 1988b, Psacharapoulos and Woodhall 1985, Za'rour 1988, Psacharapoulos, Tan, and Jimenez 1986, Ransom 1988, Winkler 1988, and Hinchliffe 1985.

the cost, effectiveness, and revenue patterns among colleges and universities in Pakistan using institution-level data.

Section 1 presents the data set; Section 2 describes the unit of costs of colleges and universities by type and location of college and by university faculty. It also examines the distribution of expenditure by budgetary category and the size and distribution of teaching and non-teaching staff. Section 3 investigates economies of scale across institutions and identifies institutional characteristics (e.g. student-faculty ratios, student-non-faculty ratios, etc.) that explain variation in costs across institutions. Section 4 presents college student exam pass rates and identifies factors that explain variation in achievement across institutions. Section 5 describes patterns of revenues and cost recovery and the grant allocation process.

1. The Data

The data for this study were compiled from annual recurrent budget submissions for 1985/86 and 1986/87 for each of the 20 public universities.[2] The budgets were supplemented with 1985 enrollment and faculty information published by the University Grants Commission (University Grants Commission 1987). For the purposes of the analysis, the Open University was omitted due to the character of its delivery infrastructure, its high enrollment (66,000), and low unit costs (US$ 40).

Provincial education authorities provided financial, enrollment and personnel data for the population of 304 colleges, but missing data reduced the analysis sample to 204. The Punjab province accounted for 99 percent of the reduction (See Table 1). The College of Education in Larkana was also deleted from the sample because its small enrollment (12) and high per student expenditure (57,467 Rs) exerted a disproportionate influence on

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2 The budgets were provided by the University Grants Commission.

the analysis results.[3] (For background information on the system of colleges and universities consult Annex 1.)

The year for which information was available varied across institutions, however. For degree colleges, data for the Karachi region of Sind are for 1988/89; those for the remainder of the Sind province and for the Northwest Frontier Province (NWFP) are for 1987/88. Baluchistan reported figures for 1986/87. All university data pertain to the 1985/86 and 1986/87 academic years. Due to these variations, all expenditures have been converted to 1987 constant prices. Additionally, the unit costs for degree colleges presented below probably understate the true cost of undergraduate programs. A sizeable proportion (about 70%) of students enrolled in degree colleges are secondary students. The budgets, however, are strictly unitary, and faculty teach across both levels which preclude estimating separately the cost of an upper secondary and undergraduate degree education. Similarly, the average costs for universities presumably understate the cost of graduate education and reflect those prevailing for undergraduate and certificate programs where 84 percent of university students are enrolled. (For additional details on the compilation, limitations and manipulations of the data, consult Annex 2).

Table 1.
Distribution of the College Population and Analysis Sample by Type of College and Province

	Population a/				Analysis Sample			
	General				General			
	Male	Female	Professional	Total	Male	Female	Professional	Total
All Provinces	195	86	13	304	137	56	11	204
Sind	65	28	10	103	64	28	10	102
Punjab	95	57	2	154	38	17	0	55
N.W.F.P.	24	8	0	32	24	8	0	32
Baluchistan	9	1	0	10	9	1	0	10
Islamabad	2	2	1	5	2	2	1	5

a/ College population figures were extracted from summary provincial reports.

[3] In a multivariate analysis, tests showed that this observation exerted an extreme influence on the estimates (Cooks D = 5.713, Leverage = .967).

2. Unit Costs of Higher Education

Given the data available, we use recurrent expenditure per student as an estimate of unit costs. This measure excludes capital expenditures and personal expenses of students, such as expenditures on transportation, lodging, and books. According to this measure, unit costs in degree colleges averaged 2,853 Rs ($164)[4] or 46.9 percent of per capita income (Table 2).[5] Costs differ, however, across institutions, ranging from 727 Rs ($42 and 11.9 percent of per capita income) in the Sind College of Commerce to 9,457 Rs ($544 and 155.3 percent of per capita income) in the Government College of Physical Education at Union Road in Karachi.[6] They also differ by type of college and by province. Costs in professional colleges are 35 percent higher than the average cost of general colleges (2,800 Rs). Among provinces, costs in Sind, Punjab, and in Islamabad are lowest, averaging 2,600-2,700 Rs. Colleges in the NWFP spend 40 percent more, and those in Baluchistan spend 85 percent more, per student than colleges in the other provinces.

Table 2.
Average Per Student Costs in Degree Colleges
(in 1987 Rs)

	Number of colleges	Mean per student recurrent cost	Standard deviation
All Colleges	165	2,853	1,550
General	154	2,799	1,418
Professional	11	3,790	1,349
Sind	102	2,576	1,661
Punjab	16	2,604	1,097
NWFP	32	3,600	892
Baluchistan	10	4,801	2,340
Islamabad	5	2,734	812

[4] Throughout, conversions to dollar amounts refer to U.S. dollars

[5] The exchange rate used is 17.399 rupees per U.S. dollar as reported for 1987 by the International Monetary Fund in the rf series. Per capita income in 1987 was $350 U.S. (World Bank 1989).

[6] See Appendix Table A.1 for a complete listing.

The average expenditure per student for the 19 public universities is six to seven times higher than unit expenditure on college students. In 1986, unit costs averaged 17,407 Rs ($1,000 or 2.9 times per capita income); in 1987, they averaged 20,960 Rs ($1,205 or 3.4 times per capita income). They range from a low 7,015 Rs ($403) at Shah Abdul Latif University to a high of 49,579 Rs ($2,850) at Islamic International. The average unit expenditure is comparable to India's 1984 average of $1,000,[7] however, U.S. and British four-year public universities spend more in absolute terms but less in relation to per capita income. Around 1985, American public universities spent eight times as much per student as their Pakistani counterparts amounting to 53 percent of per capita income; British four-year public universities spent ten times as much per student or 130 percent of per capita income (U.S. Department of Education 1986, Shattock and Rigby 1983).

Relative to general universities, professional agricultural universities cost about 25 percent more per student; and within general universities, agricultural and science faculties cost more per student than Arts' faculties, though only two general universities offer an agricultural specialization.[8] Contrary to expectations, however, engineering universities spend about 30 percent less per student than general universities.

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[7] The per student expenditure was estimated from enrollment and expenditure data in UNESCO 1989. Per capita income in India in 1984 was 260 (World Bank 1986c).

[8] We were unable to compute unit costs separately for each faculty (i.e. education, law, commerce, pharmacy, etc.). The absence of disaggregated expenditure data made it necessary to group all faculties under the three headings: arts, sciences, and agriculture.

Table 3.
Average Per Student Costs in Universities

	N	Average per student expenditure (1987 Rs.)			
		All Faculties	Arts	Sciences	Agriculture
All Universities 1985/86					
General	19	17,407	16,537	16,627	25,900
Prof. Agricultural	12	17,871	16,537	18,190	31,300
Prof. Engineering	3	22,318			22,318
	4	12,331		12,331	
All Universities 1986/87	19	20,960	19,905	19,551	25,520
General	19	21,115	19,904	20,884	23,150
Prof. Agricultural	3	27,111			27,111
Prof. Engineering	4	15,883		15,883	

Note: Arts includes the faculties of Art, Law, Commerce, and Education; sciences include the faculties of Science, Pharmacy, and Engineering. Agriculture includes only Agricultural faculties.

Personnel Expenditures. Colleges and universities differ not only in how much they spend per student but also in how their resources are allocated. Relative to universities, colleges allocate a significantly larger proportion of their budgets to salaries and allowances and a correspondingly smaller share to nonpersonnel items. On average, colleges allocate about 93 percent of their budgets to salaries and allowances, leaving only seven percent to cover all operational and other instructional costs (Table 4). Universities on the other hand allocate 65 percent of their budgets to staff compensation; but, the true proportion is probably between 65 and 80 percent since pension payments are often reported as miscellaneous expenditure under nonpersonnel headings.

A high percentage of personnel expenditure covers the salaries and benefits of nonteaching staff. In colleges, 37.8 percent of the budget and 40.8 percent of all personnel expenditure support nonteaching staff; teaching faculty account for the remaining 54.8 percent of the budget and 59.2 percent

of all personnel expenditure (Table 4). With few exceptions,[9] all degree colleges show this pattern of expenditure. Among the universities, 34.7 percent of the budget and 53.4 percent of all personnel expenditure is allocated to support staff and administrators.

Table 4.
Percentage Distribution of College and University Budgets

	Colleges			Universities a/			
	All	General	Professional	All	General	Agric.	Engin.
Unit Cost (Rs)	2,853	2,799	3,790	19,183	19,492	24,715	14,107
Percent of budget allocated to:							
All Personnel b/	92.6	92.5	93.6	65.0	65.2	68.8	61.6
Faculty	54.8	55.0	50.3	30.3	30.0	35.0	27.1
Non-Faculty	37.8	37.5	43.3	34.7	35.2	33.8	34.0
Non-Personnel c/	7.4-9.2	7.5-9.4	6.4-6.7	35.0	34.8	31.2	38.4
Library & Research	.95-3.5	.95-3.6	.98-1.3	3.8	4.0	2.4	4.2
Other	6.5-3.9	6.6-3.9	5.4-5.1	31.2	30.8	28.8	34.3
Non-Faculty Personnel				34.7	35.7	33.8	34.0
Non-teaching	.	.	.	29.4	29.5	29.1	29.2
Administration	.	.	.	5.3	5.7	4.7	4.8

a/ The figures are averages for 1985/86 and 1986/87. Refer to Appendix Table A.2 for each year separately.
b/ See Annex 2 for the estimation method used to compute the college personnel expenditure breakdown.
c/ For colleges, library & research includes expenditure on library books, periodicals, magazines, chemicals, glassware, and scientific equipment. A range is given because colleges also receive grants for these items which do not always appear in their budget statements. For universities, expenditure on research studies is also included.

Colleges and universities spend such large shares of their resources on personnel in part because they are commonly used as places of employment for many unskilled Pakistanis. As a result, nonteaching staff are numerous and their civil service grades show a strong preference for hiring

[9] The only exceptions are colleges in Baluchistan where larger budget shares are allocated to faculty salaries.

servants over personnel who directly support research and teaching, such as teaching and research assistants and laboratory technicians. Nonteaching staff account for between 75 to 90 percent of all personnel employed in universities, outnumbering teaching staff by an average of 4 to 1 (Appendix Table A.3). Among colleges, the ratio of support staff to faculty averages 1:1, ranging from .4 to 2.8. Of all nonteaching staff, between 75 to 85 percent in colleges and university teaching departments (as opposed to those sections considered administrative)[10] are drivers, gardeners, watchmen, messengers, tea servers, clerks, etc. in the lowest grades (1 to 7) of the civil service pay scale (Table 5). In universities, they outnumber technical and administrative support staff (grades 8 to 16) by three to one. Engineering universities are the exception with the lowest proportion of these staff (62 percent) and a higher proportion of technical staff.

Table 5.
Nonteaching Staff in Colleges and University Teaching Departments by Civil Service Grade

	Civil Service Grade a/			
	1 to 7	8 to 11	12 to 16	Total
Colleges	82.9	12.7	4.4	100
General	82.7	12.7	4.6	100
Professional	86.4	12.1	1.5	100
University Teaching Departments b/	75.7	11.8	12.5	100
General	81.2	7.2	11.6	100
Agricultural	82.2	9.7	8.1	100
Engineering	62.0	21.1	16.9	100

a/ Grades 1-7 include drivers, gardeners, watchmen, messengers, etc. Grades 8-11 include technical assistants, laboratory assistants, library workers, and lower level clerical staff. Grades 12-16 include high level technical staff and their supervisors.
b/ Figures are averages for 1985/86 and 1986/87. See Appendix Table A.3 for each academic year.

[10] Teaching and administration sections are categories in university budgets. Teaching sections refer to academic departments; administration sections include the registrar, admissions, etc.

Nonpersonnel Expenditures. Expenditure on nonpersonnel items comprises the remaining seven to nine percent of college budgets and the remaining 35 percent of university budgets. Nearly all nonpersonnel expenditure is allocated to overhead which includes expenditures on electricity, transportation, rent, office supplies and building maintenance;[11] a very small share is allocated to research and instructional materials such as library books, periodicals, journals, scientific equipment, chemicals and glassware.

Incomplete data from the colleges indicate that, on average, one percent of college budgets is allocated to these support materials. This amounts to 26 Rs ($1.50) per student, about the same amount that Sub-Saharan African countries spend per primary student on instructional materials (World Bank 1988). In addition to these allocations, however, colleges also receive grants from provincial governments targeted for library materials, and for scientific hardware and software. From the data provided, we could not determine if these are reflected in the budgets. If the additional grants are included, funds for libraries and scientific hardware and software increase to an average of 3.5 percent of total expenditure or to 100 Rs ($5.75) per student.

Universities invest substantially more than colleges in research and instructional materials -- 730 Rs or $42 per student. This is because they spend more per student generally, not because they allocate a larger share of their budgets to teaching and learning materials. Allocations to research, libraries, equipment, and other learning support materials average only 3 to 4 percent of university budgets. By way of comparison, U.S and British public universities allocate from 15 to 25 percent of their resources (or $1,200-$2,500 per student) to research and libraries (U.S. Department of Education 1986, Shattock and Rigby 1983).

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[11] As already noted, due to university accounting practices, in some cases a large share of "other expenditure" is pension payments. Since these are technically personnel- related expenditures, the share of overhead expenses in the budget may be overstated for colleges and universities that include them in overhead.

3. Institutional Characteristics and Unit Costs

Framework. The variations in unit costs among colleges and universities discussed above may reflect differences in: (1) scale economies and their corresponding efficiency in resource use, (2) the mix of programs offered, and (3) the quality of instruction. To test if these factors are related to cost differences between institutions, we adopted the traditional economic average cost framework.[12] We assume that managers of degree colleges and universities seek to minimize average unit costs subject to the realization of a desired level of instructional quality per pupil. Within an institution, unit costs may be high initially because enrollment may be low at the outset but staff and facilities must be provided to offer a minimum number of courses at a certain level of quality. Given this minimum number of offerings and desired quality of instruction, an institution may, over time, increase its enrollment and lower its average costs simply by increasing the use of existing resources -- i.e., by increasing student-personnel ratios, the number of hours professors teach, and/or the use of facilities. In the long run, the decline in average costs should taper off; or, costs may begin to increase if the variety of courses and specializations offered are broadened, more staff are hired, and student-staff ratios fall, or if quality is to be maintained as enrollment rises.

College Characteristics. Table 6 displays the relationship between enrollment and unit costs among degree colleges. There is some evidence of economies of scale. Unit costs decline quite rapidly as college size increases from below 400 to between 1,300 and 1,600 students (column 1). The cost associated with small student enrollment is substantial. Colleges with enrollments of 400 or less cost 2.5 times more than colleges 3 times larger in size. A wide variety of courses or a larger number of science

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[12] Although institutions of higher education, particularly universities, are more accurately multi-product firms that conduct both teaching and research, sparse data on research output and the fact that little research is carried out in Pakistani colleges and universities make this an inappropriate framework for this analysis.

courses does not appear to explain the higher cost of small colleges. Smaller colleges offer fewer courses in all areas (columns 7 and 8).

Table 6.
Average Unit Costs and Other Indicators by College Size

Enrollment	N	Per Student Cost (1)	Student/ Faculty Ratio (2)	Student/ Nontch Ratio a/ (3)	Percent of Budget to Nontch Staff (4)	Percent Faculty Grade 18+ (5)	Percent Budget Non-Personnel (6)	Number of Subjects (7)	Percent Subjects in Science (8)
<= 399	26	5422	15	18	39.5	18.8	10.1	12	28.6
400-699	43	3136	27	26	37.8	23.2	8.8	13	30.1
700-999	31	2582	32	36	40.1	24.0	7.9	14	37.2
1000-1299	31	2431	35	59	39.6	24.2	7.2	16	34.4
1300-1599	21	2023	38	65	35.9	28.7	5.6	18	34.0
1600-1899	17	2373	37	40	38.4	32.0	5.4	17	43.6
1900-2199	12	2348	32	55	35.3	30.1	6.9	18	36.2
> 2200	23	1726	47	80	32.7	30.7	5.0	20	27.2
All	204	2853	32	46	37.8	25.5	7.4	15	33.2

a/ Data on non-teaching staff pertain to a subsample of 110 colleges. See Appendix Table A.1.

The lower unit costs among larger colleges is strongly related to a more intense use of staff, both teaching and nonteaching (columns 2 and 3). The number of students per faculty member increases from 15 among the smallest colleges, peaking at an average of 47 among colleges with enrollments over 2,200. Overall, however, student-faculty ratios are astonishingly high in all but the smallest schools.[13] A similar increase is noted for student-nonteaching staff ratios which increase from an average of 18 among the smallest colleges to 80 in the larger ones. Correspondingly, larger schools spend a smaller share of their resources on nonteaching staff (column 4).

The lower per student costs and higher student faculty ratios among the larger colleges may, however, signal that lower quality education is offered in these institutions relative to those smaller in size. In the absence of reasonable measures of instructional quality such as test scores or

[13] Student-faculty ratios average between 10 and 20 in the U.S. and Europe (UNESCO 1989).

pass rates on examinations,[14] we use the percent of faculty in civil service grades 18 and above and the proportion of the budget allocated to nonpersonnel items as proxies for instructional quality. Larger colleges have a higher proportion of more experienced, more highly educated faculty (column 5). However, it appears that the larger proportion of more highly qualified faculty in larger schools leaves a smaller share (only 5 percent) for overhead and other essential inputs (column 6).

University Characteristics. Universities show similar unit cost patterns; larger universities have lower costs (Table 7). A particularly large drop in unit costs is evident for universities that enroll about 1,400 students or more. The four smaller universities that enroll under 1,400 students -- Islamic International, NWFP Agriculture, AJK, and QIA -- spend about 2.5 times more than their larger counterparts.

The lower cost of large universities is again strongly related to a more intense utilization of teaching and nonteaching staff. On average, larger universities have 16 students per professor and 5 per nonteaching staff; small universities have 5 students per professor and 2 per nonteaching staff. The costs associated with these low ratios are substantial. On average, institutions with student-faculty ratios lower than 8:1 have unit costs 2.5 times higher than those with ratios of 8:1 or more; and, where student-nonfaculty ratios are 3:1 or less, unit costs are 86 percent higher. This suggests that raising enrollment at given staff levels, particularly nonfaculty staff levels, would substantially lower costs in small universities.[15]

Increasing enrollment, however, is only a reasonable option when university space permits. Although classroom area per student may be a crude

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[14] Exam results were obtained only for a subset of colleges. An analysis of the results is presented in Section IV.

[15] Shah Abdul Latif University, for example, had less than 1300 students in 1985/86, but had a student-faculty ratio of 21:1, and one of the lowest unit costs (7,592 Rs).

measure of space utilization, nonetheless the data in the last column of table 7 suggest that classroom space is adequately used in eight of the 18 universities. In these institutions, classroom space per student compares favorably with the international standard of 12.7 ft^2 and all of them are high enrollment, low cost institutions. But, four universities have very limited space per student while six others have excessive space that might be used more efficiently. In AJK, NWFP Agriculture, NED Engineering, and the University of Punjab classroom space ranges between 3 and 7ft^2. This suggests that for AJK and NWFP Agriculture, both low enrollment high cost institutions, limited classroom space may block their ability to achieve economies. In contrast, Islamic International, Quaid-I-Azam, NWFP Engineering, Sind Agriculture, B.Z. Multan and Islamia Bahawalpur -- all high cost small institutions -- have excessive classroom space relative to their enrollment. Moreover, student-faculty ratios in these three institutions are among the lowest. Together these indicate that, given existing facilities, increased enrollment in these six universities could result in cost savings without driving student-faculty ratios beyond acceptable norms.

Larger universities, like larger colleges, do not appear to sacrifice the quality of faculty for lower costs. Rather, they employ a greater proportion of more experienced and more highly educated faculty than do smaller schools. Among the ten largest, for example, 31 percent of faculty are in grades 18 and above compared to an average of 25 percent in the other schools. Given this, one might expect larger universities to allocate a larger share of their budgets to faculty salaries and a correspondingly smaller share to nonteaching salaries or to overhead, yet no strong patterns support this. The functional distribution of expenditures are similar among small and large universities, principally because larger universities have higher student faculty ratios.

Table 7.
Average Unit Costs and Other Indicators by Size, Universities 1985/86-1986/87

	Total Enrollment	Unit Cost	Students Per: Faculty	Students Per: Nonteaching Staff	Percent Faculty Grade 18+	Percent Graduate Students	Percent of Budget on: Salaries & Allowances: Non-Personnel	Salaries & Allowances: Faculty	Salaries & Allowances: Nonteaching Staff	Area/ Student(ft^2)
5 ISLAMIC INTERNATIONAL	461	39,423	5	1	23.1	15.1	52.7	29.3	79.5	19.45
14 NWFP AGRICULTURE	727	33,563	4	2	32.1	37.4	32.5	52.8	40.2	8.22
1 AZAD JAMMU & KASHMIR	836	31,677	5	2	17.2	20.7	31.0	38.8	37.1	2.72
6 QUAID-I-AZAM UNIV	1,142	35,805	5	2	29.6	81.2	31.9	43.1	32.1	32.40
19 NWFP ENGINEERING	1,430	19,271	13	3	37.6	0.0	43.7	25.2	29.5	14.71
7 SHAH ABDUL LATIF	1,469	7,592	21	6	12.9	29.6	22.3	34.9	45.0	.
15 SIND AGRICULTURE	1,837	23,451	8	2	34.6	14.6	30.9	36.2	39.2	29.15
4 ISLAMIA U.BAHAWALPUR	1,852	14,745	12	3	19.6	70.6	33.7	33.8	44.3	18.07
2 B. Z. MULTAN	1,869	17,453	17	3	14.0	45.7	44.6	19.1	35.4	16.28
3 GOMAL UNIVERSITY	2,438	13,435	10	2	18.6	23.2	24.7	40.0	54.0	6.66
8 UNIV. OF BALUCHISTAN	2,744	14,468	12	4	18.7	49.2	25.0	35.7	36.7	12.25
17 MEHRAN ENGINEERING	3,396	14,427	15	4	28.0	6.2	36.7	32.2	36.8	12.44
18 NED ENGINEERING	4,085	9,194	32	7	32.9	8.5	43.3	26.8	38.5	4.34
12 UNIVERSITY OF SIND	4,621	2',828	12	3	31.1	34.7	42.2	26.1	28.1	11.27
13 AGRICULTURE FAISALABAD	4,922	17,131	10	3	35.9	24.5	30.2	35.4	38.8	11.10
16 ENGINEERING LAHORE	5,286	13,536	17	4	47.1	4.8	30.1	31.8	37.8	14.71
9 UNIVERSITY OF KARACHI	8,387	11,431	20	7	34.5	45.4	41.8	33.5	28.9	13.27
11 UNIVERSITY OF PUNJAB	9,245	13,968	18	3	34.1	44.7	40.5	23.5	37.4	4.37
10 UNIVERSITY OF PESHAWAR	9,355	9.092	17	6	32.7	16.6	27.6	39.8	30.6	11.50
All	66,112	18,183	13	3	28.1	30.1	35.0	33.6	39.5	13.49
General	44,419	19,493	13	3	23.8	39.7	34.8	33.1	40.8	13.47
Agricultural	7,486	24,715	7	2	34.2	25.5	31.2	41.5	39.4	16.16
Engineering	14,207	14,107	18	5	36.4	4.9	38.4	29.0	35.6	11.55

Note: The figures in this table are averages for 1985/86 and 1986/87. Refer to Appendix A Table 2 for each year separately.

Model. To test statistically the strength of the relationship between unit costs and scale economies, efficiency in resource use, the mix of programs offered, and the quality of instruction, we move into a multivariate analysis which assumes a minimized average cost function of the form:

$$AC^* = f(S, X_1 \ldots X_n; Q_0, p_1 \ldots p_m)$$

where AC^* = total recurrent costs/total enrollment

S = total enrollment

$X_1 .. X_n$ = a vector of exogenous factors

Q_0 = desired level of quality

and $p_1 \ldots p_m$ = input prices.

We further assume that the input prices ($p_1 .. p_m$) are the same for all Pakistani universities and colleges.[16] We estimated this equation separately for the sample of degree colleges and the population of universities because a Chow test showed that the structure of the cost equations were different for the two groups[17] and because data for colleges and universities were not strictly comparable.

Several specifications of this equation were estimated for colleges and universities to arrive at the most parsimonious model of best fit for each. Because there is no consensus on the functional form for estimating average costs, studies of economies of scale in education generally test the relationship between college size and unit costs using both a quadratic and

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[16] This is a reasonable assumption given that 94 percent of college and 65 percent of university budgets are allocated to faculty salaries which are governed by the same civil service pay scale.

[17] The model estimated for the Chow test included the independent variables: enrollment, student-faculty ratios, the proportion of faculty in grades 18 and above, the proportion of expenditures on non-personnel items, and a dummy variable for general institutions. The model was estimated on the combined sample of 165 degree colleges and double observations (1985/86 and 1986/87) for 19 universities. The computed F-value for the Chow test was $F(8,164) = 65.05$ indicating that separate equations should be estimated for degree colleges and universities.

hyperbolic function.[18] The former approach assumes the existence of an optimal enrollment beyond which diseconomies set in. The latter assumes that no diseconomies of scale as enrollment increases. Such a situation would obtain where limits are imposed on some factors to ensure that diseconomies do not set in, for example when student-faculty ratios are not allowed to fall below a certain level (Lee 1984).

These two functional forms are specified as follows:

$$(1)\ AC = \alpha_1 + \beta_1 ENR + \beta_2 ENR^2 + \epsilon$$

$$(2)\ AC = \alpha_2 + \beta_2 (ENR)^{-1} + \mu$$

College Cost Functions. The results of the multivariate regression analysis for the sample of 204 colleges are displayed in Table 8. Variable means and correlations are presented in Appendix Tables A.5 and A.6. In addition to the final model, we tried a number of other specifications on the full college sample and on a subset of colleges that reported enrollment and faculty data by area of study and degree level. We included: (1) dummy variables for the years for which data were reported in order to capture changes in the economy, shifts in grant allocation policies, and the change in civil service pay scale implemented in July 1987, (2) student-faculty ratios in Arts and Science faculties, (3) the proportion of students enrolled in science fields, (4) the proportion of B.A. level students, (5) student-nonteaching staff ratios, and (6) dummy variables for the sex of the college and if the college had been nationalized. None explained a significant proportion of the variation in per student costs and the results are not reported here.

Columns (1) and (2) in Table 8 display the results of estimating the quadratic and hyperbolic formulations, respectively. The hyperbolic form provides an unquestionably better fit for the data, explaining 54.6 percent of the variation in unit costs among degree colleges relative to the 33.0 percent

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[18] See Lee 1984, Cohn 1968, Wales 1973, Watt 1980, World Bank 1986b, among others.

explained by the quadratic specification. Although the estimated coefficient on enrollment^2 is significantly different from zero (t=5.44), this should not be interpreted as evidence of scale diseconomies. It is capturing the slightly higher average costs among a small group of colleges with enrollments between 1,600 and 2,200.[19] The quadratic formulation performed consistently less well throughout and no further results for this formulation are reported.

Table 8.
Regression Results For The College Sample

Independent Variable	Estimated Coefficients (t Value) (1)	(2)	(3)	(4)
Intercept	4717031** (21.92)	1698.27** (16.35)	3011.63** (18.05)	1027.56** (2.75)
Enrollment	-2.16** (-4.28)	-	-	-
(Enrollment)2	0.0003** (5.44)	-	-	-
(Enrollment)-1	-	783049.30** (15.65)	613775.07** (13.88)	655729.41** (15.41)
Student-faculty ratio	-	-	-33.54** (-9.24)	-37.99** (-12.00)
Percent of budget on non-teaching staff	-	-	-	38.63** (11.08)
Percent of faculty grades 18 +	-	-	-	12.05** (2.96)
Number of subjects offered	-	-	-	76.38** (5.84)
General College (dummy)	-	-	-	-923.14** (-4.23)
Adj R2	0.330	0.546	0.679	0.823
F Statistic	50.96	244.81	216.12	157.66
Number of observations	204	204	204	203

*, ** = coefficient is different from zero at the .05, and .01 or better levels of probability.

[19] See Appendix Table A.1.

Columns (2) through (4) display the parameter estimates for the models that fit the data best. The results confirm the descriptive data showing that total enrollment and student-faculty ratios explain most of the variation (67.9 percent) in unit costs among colleges (column 3).

Economies of scale are evident in the larger degree colleges -- the larger the college, the lower the cost of educating each student; at higher levels of enrollment the marginal effect diminishes. Given that most expenditure is for salaries, higher student-faculty ratios are associated with lower unit costs. Similarly, the smaller the nonteaching and administrative share of the budget, the lower the unit cost. Holding these constant, general colleges still cost, on average, 25 percent less (923 Rs) than professional colleges.

Included in another specification were dummy variables for the Baluchistan and NWFP provinces. The higher unit costs noted for these provinc s relative to others is not significantly different from zero. Holding constant the variables in the equation in column 4, there is no variation in unit cost across provinces.

The estimates in column (4) suggest that cost savings associated with increased college size are substantial for small colleges. Given an enrollment of 400 students, a 1 percent increase in enrollment is associated with a 3.8 and 4.1 percent decrease in unit costs, in Models 3 and 4 respectively.[20] For larger colleges, unit costs become increasingly inelastic. At the mean of 1,200 students for example, the models predict a 0.43 and 0.46 percent decrease in unit cost for a 1 percent increase in enrollment.

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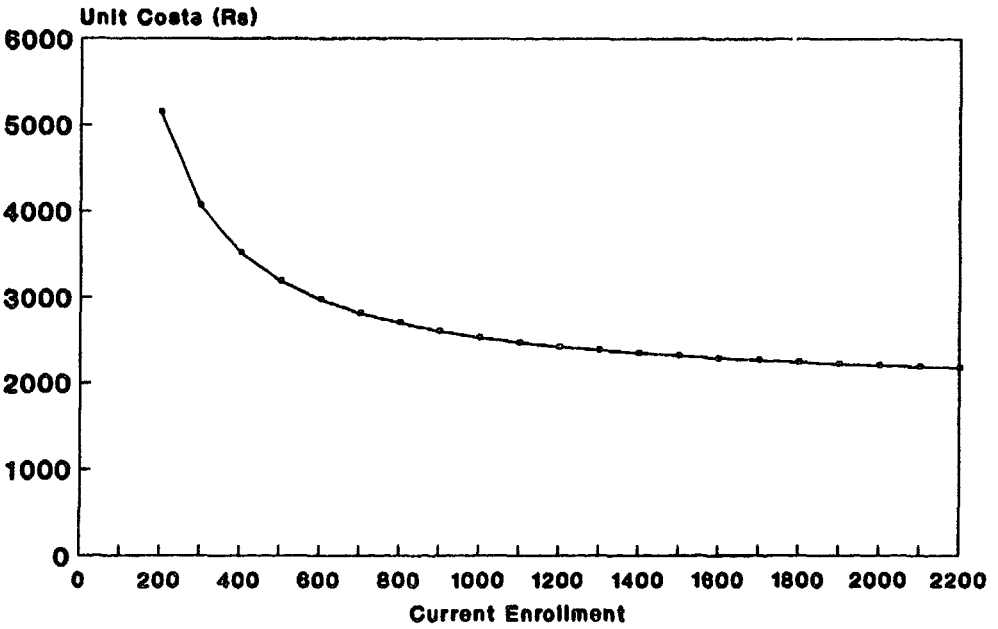
[20] The hyperbolic specification of the cost function permits one to interpret the coefficient of the inverse enrollment term as an estimate of the point elasticity of unit expenditure with respect to enrollment. The coefficient is converted to an elasticity for a level of enrollment X with the formula: $- \beta_1/X^2$.

Figure 1 illustrates this pattern of predicted unit cost savings associated with increased enrollment. Among the smallest colleges, increasing enrollment from 400 to 500 results in a predicted savings of 330 Rs per student, or 6 percent of the current average costs of small colleges. Similarly, increasing enrollment from 400 to the college sample average of 1,200 yields a predicted savings of 1,092 Rs per student, or a 20 percent reduction in recurrent average costs of small colleges.

Figure 1
Decline in Per Student College Costs When Current Enrollment Increases by 100



Computed from estimates in column (4) and predicted at the sample means.

Reductions in average costs associated with an increase in the student faculty ratio are small; however, at low student faculty ratios these reductions can be nontrivial. At any level of enrollment, an increase of one student per professor is associated with a 38 Rs reduction in unit costs (1.3 percent of the mean). Similar savings could be realized by cutbacks in nonteaching staff.

Conclusion. The descriptive data and regression results support three conclusions. First, they suggest that, on average, colleges already operate with minimal faculty. There is little room for substantial savings by enrolling more students at current faculty levels except among the 30 to 40 smallest colleges. Moreover, for most colleges increasing student faculty ratios may damage the quality of education. Fully 41 percent of all colleges already operate with student-faculty ratios of 30 or more. Additionally, the high student-faculty ratios combined with the trivial sums that support other operational expenses and minimum teaching and research support personnel suggest that the quality of instruction in most degree colleges is already low.

Second, the large cadres of administrative and support staff drive up the per student cost of education in degree colleges. Cut-backs in these staff could release substantial resources for instructional materials and/or additional faculty. The feasibility of cutting back on administrative support staff merits further investigation. The college data did not permit a detailed investigation of the functions of nonteaching employees. However, data from Karachi shows that colleges, like the universities, favor a nonteaching staff structure weighted in favor of the lowest grades. If this structure holds for other colleges, then clearly savings could be gained by trimming nonteaching staff at no loss to instructional quality.

Finally, degree colleges with low enrollment are very expensive relative to larger colleges. Although further investigation of these colleges and how they come to be is required to determine the most appropriate method of reducing the cost burden of small colleges, at least three options could be considered -- rational criteria for allocating government funds to colleges,

increasing enrollment, and consolidation. Government can develop rational criteria for allocating funds to colleges, criteria that include a demonstration of the demand for college education in the area and the provision of appropriate facilities. Some of these small colleges are no more than a few rooms in a building established with minimal planning by politicians in order to gain the support of communities. In some colleges, economies may be achieved by increasing enrollment, but these cases are few. Small colleges may be more costly not because they choose to enroll fewer students but because they have limited facilities or are located in areas where the demand for their programs is low. In these cases, consolidation could be considered.

University Cost Functions. The results of the multivariate analysis for the universities are presented in Table 9. The equations were estimated on 38 observations -- two observations for each university, one for 1985/86, the other for 1986/87. The estimates of the quadratic and hyperbolic formulations are shown in columns (1) and (2) respectively. Here again, the hyperbolic specification more adequately depicts the relationship between unit expenditure and enrollment in universities; therefore, the reported results are restricted to this specification.

In addition to the models presented, several other specifications were estimated. The other variables tested included the percent of students in science faculties, percent of certificate level students, a dummy variable for type of university, student-overall personnel ratios, percent of expenditure for research-related investments, total area, classroom area per student, and academic area per student. None yielded significant or consistent results and the models are not reported here.

Columns (3) and (5) show the extent to which variations in per student expenditure are associated with student-faculty and student-nonteaching staff ratios, respectively.[21] Columns (4) and (6) present

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[21] Due to multicollinearity, it was impossible to estimate their joint effect.

estimates of the full models which include the percent of faculty above grade 18 as a proxy for faculty quality, and the proportion of the budget allocated to nonpersonnel expenses to capture the cost effects of overhead. The share of enrollment in graduate programs is used as an indicator of program mix, and a control for the year the data represent is also introduced. The results are similar to those reported for the college sample.

Table 9.
Regression Results for Universities

	Estimated Coefficients (t Value)					
Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	33052.49** (9.912)	11031.85** (7.275)	22283.97** (7.501)	5507.48 (1.173)	21461.97** (6.464)	6936.93 (1.495)
Enrollment	-6.9235** (-3.699)	-	-	-	-	-
(Enrollment)2	0.0005** (2.777)	-	-	-	-	-
(Enrollment)-1	-	14079809.52** (7.363)	9239434.57** (4.709)	9868297.24** (4.957)	9874341.74** (4.751)	12186566.85** (6.627)
Student-Faculty Ratio	-	-	-646.05** (-4.180)	-626.34** (-4.335)	-	-
Student-Nonteaching Personnel Ratio	-	-	-	-	-2319.24** (-3.429)	-1989.45** (-3.450)
Percent of Faculty Above Grade 18	-	-	-	209.88** (2.347)	-	294.38** (3.291)
Percent of Budget On Nonpersonnel	-	-	-	203.84** (2.066)	-	-
Percent Graduate Students Enrolled	-	-	-	65.26 (1.787)	-	81.21** (2.125)
Year (Dummy: 1986 = 1)	-	-	-	2303.91 (1.576)	-	2653.27 (1.701)
Adj R Square	0.38	0.59	0.72	0.81	0.68	0.79
F Statistic	12.267	54.219	49.248	27.167	41.089	27.656
No. Observations	38	38	38	38	38	38

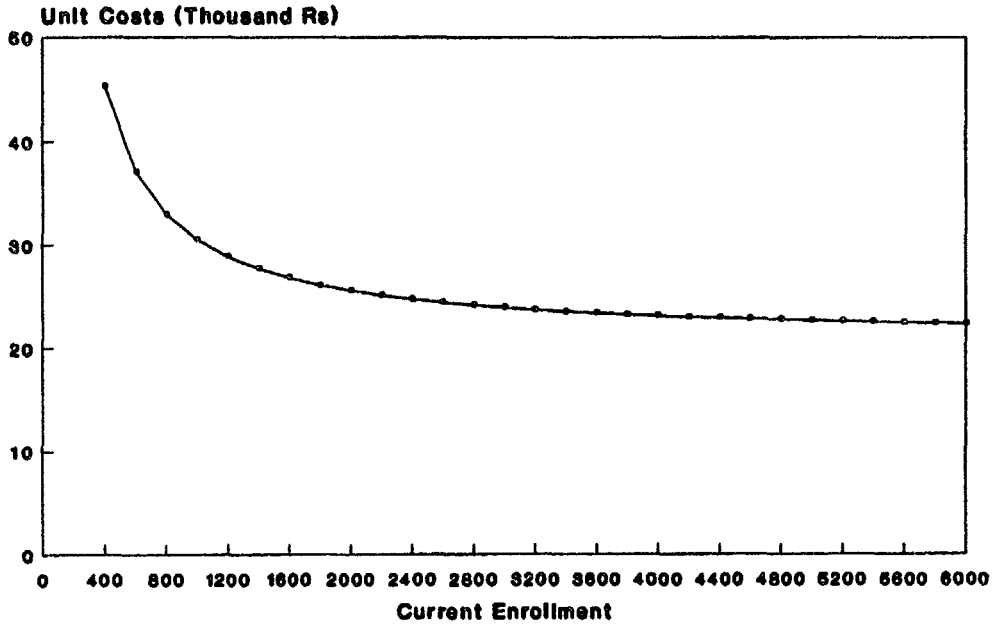
Note: *, ** indicate coefficient is significant at the .05, and .01 level of probability or better.

Enrollment and staffing intensity alone account for 59 to 72 percent of the variation in unit costs. Larger universities have lower unit costs. Higher student-faculty and student nonteaching personnel ratios are associated with lower unit costs, the latter having a greater marginal effect. Universities in 1986 spent about 2,653 Rs (20 percent) more per student than they did in 1985, ceteris paribus. Given that the source of most university income is government grants, this increased expenditure is largely attributable to increased funding (See Figure 3, section IV).

Similar to the college results, the models indicate that cost per student is fairly elastic with respect to enrollment in smaller universities. At an enrollment level of 1,400, a 1 percent increase in enrollment is associated with a 5 to 6 percent decrease in unit costs. For enrollment levels at or above the mean (3,479 students), unit costs are less elastic with respect to enrollment.

Figure 2 illustrates the predicted per student cost saving when enrollment increases. For example, consider the enrollments in the Islamic International and Azad Jammu & Kashmir Universities of 388 and 902, respectively. Increasing enrollment by 100 yields an estimated 5,212 Rs saving per student (or 13.2 percent of current unit costs) in the former instance, and a 1091 Rs savings (3.4 percent of unit costs) in the latter. Raising their enrollment to 3,479 -- the university average -- is associated with a 22,597 Rs (46 percent) and 8,103 Rs (22 percent) savings, respectively.

Figure 2
Decline in Per Student University Costs When Current Enrollment Increases by 100



Computed from estimates in column (4) and predicted at the population means.

The estimated cost savings associated with a more intense use of nonteaching staff are also substantial; but, those associated with an increase in student-faculty ratios are considerably smaller. The estimated decrease in unit cost associated with an increase of one student per nonteaching staff is 1,989 Rs (10.4 percent of the mean), while an increase of one student per faculty member, ceteris paribus, is associated with a 626 Rs (3.3 percent of the mean) savings in unit cost.

Nonpersonnel expenditures are largely made up of overhead expenses; research equipment and library investments account for only 3 to 4 percent of this part of the budget. Universities that spend a higher percentage of their budgets on overhead items have higher unit costs, all other factors equal.

Conclusion. The analysis suggests that considerable efficiency gains can be made at current expenditure levels. Smaller universities can lower their unit costs by increasing enrollment except where physical limitations prevent expanded enrollment (or cases where demand is low), such as in AJK and NWFP Agriculture. In all cases, retrenching nonteaching staff will substantially lower unit costs. The large marginal savings associated with more intense employment of staff, and the pattern of staffing that disproportionately favors lower grade employees, indicate that these aspects of university management are areas through which significant improvements in efficiency can be made.

Substantial qualitative and efficiency improvements in university education can also be secured through reallocative measures. Considerable latitude exists in shifting funds across personnel and nonpersonnel components of university budgets. On the personnel side resources devoted to nonteaching staff could be reallocated to augment and/or upgrade teaching faculty. For example, at B.Z. Multan only 14 percent of the teaching staff are Grade 18 or above, and the university spends almost twice as much on nonteaching staff as it does on teaching faculty. On the nonpersonnel side, overhead expenses consume a large share of university budgets; a negligible portion of the nonpersonnel budget is spent on research equipment and library facilities. Further investigation into the details of overhead expenditures would indicate exact areas in which adjustments could be made to release additional resources for research equipment and teaching materials.

4. Effectiveness

The low expenditure per student and minimal learning, teaching, and research support resources in Pakistan's colleges suggest that little is probably taught and learned. The low pass rates of students who take the intermediate and undergraduate exams support this conclusion.

Pass rates. Table 10 shows the percent of exam takers who passed the 1988 F.A., F.S., B.A. and B.S. exams in a sample of colleges. On these exams, a final score of 33 percent correct is the minimum required to pass.

To obtain a passing score, many parents pay their sons' and daughters' teachers for tutoring sessions after school. Cheating is also common.[22] This notwithstanding, in 1988, only 39 percent of intermediate students (grade 12) passed the F.A. and F.S. exams, and only one-third of undergraduate students passed the B.A. and B.S. exams. Students attending college in the Sind performed better than those in other provinces and women's colleges scored consistently better than men's colleges.[23] On the F.A. and F.S. exams only 34 percent of men passed compared with an average pass rate of 50 percent for women; on the B.A. and B.S. exams only 25 percent of the men passed compared with 50 percent of the women. These low pass rates, especially among men, suggests that colleges do not adequately teach students what they are required to know.

Table 10.
Percent Passing the F.A., F.S., B.A. and B.S. Exams, 1988

	Intermediate		Undergraduate	
Province	Arts (n)	Science (n)	Arts (n)	Science (n)
Sind	58 (24)	57 (22)	-	-
Punjab	36 (55)	45 (54)	34 (49)	33 (32)
NWFP	41 (31)	14 (31)	30 (15)	31 (26)
Baluchistan	-	-	-	-
Islamabad	-	-	50 (4)	30 (4)
Male Colleges	33 (71)	35 (82)	26 (46)	24 (45)
Female Colleges	59 (39)	49 (25)	49 (22)	52 (17)
All Colleges	42 (110)	36 (107)	34 (68)	32 (62)

Note: (n) = number of colleges.

[22] For example, 10 percent of students who sat for the 1988 exams administered by the University of Peshawar were disqualified for having cheated; and in one college affiliated with the University of Punjab, all students had reportedly cheated in 1989.

[23] Most colleges are sex segregated, and only a small number of women attend the few co-ed colleges.

One might then ask if certain college characteristics are associated with higher or lower levels of achievement. Can these low pass rates be explained, for example, by the low level of resources on which colleges operate? By the breadth (or narrowness) of their course offerings? By the minimal amount spent on teaching and learning materials? By the quality of the professors? Or, by their high student faculty ratios?

The following sections present the results of an exploratory regression analysis that examines the relationship between exam pass rates and these college characteristics. The testable hypotheses are both limited and driven by the explanatory variables available in the college data set. We do not, for example, have data on the students' background or ability, nor on numerous other variables -- such as the time students spend on homework, or in science labs -- that may influence performance. Multicollinearity also reduced the number of usable explanatory variables.

With these limitations in mind, we test the hypotheses of no relationship between college-level exam pass rates and: (1) the degree to which the college specializes in teaching arts or sciences, (2) the breadth of the curriculum offered, (3) the availability of libraries, scientific equipment and other instructional materials, (4) the quality of the faculty, and (5) class size, while holding constant the number of students who took the exam. The latter is introduced to control for selection since the spread of ability is likely to be wider when the pool of students sitting for the exam is larger. Per student expenditure was not included as an explanatory variable because it explained no variation in pass rates (due to multicollinearity), and because the number of students taking the exam and per student expenditure both captured the effect of school size. Given this, the number of exam takers is used because it is theoretically more meaningful.

Variable Measures. The extent to which the college specializes in teaching arts or sciences is measured as the proportion of intermediate students or undergraduates enrolled in arts and sciences. The breadth of curriculum is captured by the number of arts or science courses the college offers. The availability of teaching and learning materials is measured by

college expenditure on libraries, scientific equipment, chemicals and glassware as a percent of total expenditure. Faculty quality is proxied by the proportion of faculty in grades 18 and above; and, the effect of class size is captured by student-faculty ratios.

Model. To test the five hypotheses, we estimated the following model for the F.A., F.S., B.A., and B.S. pass rates using OLS regression.

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \epsilon$$

where

X_1 = the number of students who took the exam,
X_2 = the proportion of intermediate students or undergraduates enrolled in arts and sciences,
X_3 = the number of arts or science courses the college offers,
X_4 = expenditure on libraries, scientific equipment, chemicals and glassware as a percent of total expenditure,
X_5 = percent of faculty in grades 18 and above,
X_6 = student-faculty ratio, and
ϵ = error term.

For the F.A. exams, regression equations were estimated separately for male and female colleges because the Chow test of homogeneity showed the structure of the equations to be different for them ($F = 10.41$, $p < .005$).

In estimating the model, we also included a dichotomous variable for female colleges and for colleges in the Sind province (on the F.A., F.S. exams) to test if students there still performed better after having controlled for the college offerings, instructional inputs, and class size. Additionally, we transformed several variables to improve the fit of the model; however, none resulted in significant improvements. The results of the final models estimated are presented in Tables 11 and 12 for the intermediate and bachelor's exams, respectively. Means and correlations are displayed in Appendix Tables A.10 to A.12.

Intermediate Results. For the intermediate exams, the college characteristics included in the model explain from 20 to 29 percent of the variation in exam pass rates, and yield the following results.

Students enrolled in colleges that specialize in the arts perform worse than those enrolled in colleges that offer a more even mix of arts and sciences, hereafter referred to as the more general colleges. Among all colleges, male and female, the higher the concentration of arts students the lower the pass rate. Students in specialized science colleges, however, perform better than their peers in the more general colleges. This is, in part, because specialized science colleges also offer a broader range of science courses and this broader curriculum better prepares students for the exams.[24] Holding constant the degree of specialization in the arts or sciences, colleges that offer a larger number of science subjects, and male colleges that offer a broader range of arts subjects, have higher pass rates.

The hypothesis of no relationship between student-faculty ratios and pass rates is rejected for male arts colleges. The model in column (2) estimates a .53 percentage point decline in the proportion of students who pass when the number of students per faculty increases by one. But, in female colleges and specialized science colleges student-faculty ratios are not associated with pass rates.

Female colleges outperform male colleges in both the arts and sciences. However for females, the characteristics of the college are not significant predictors of their success. Because the data show few differences among male and female colleges, women's higher exam pass rates are probably explained by a higher degree of selection and by individual characteristics.

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[24] A high degree of collinearity between the percent of students in the field and the number of courses offered in science programs makes the degree of specialization proxy insignificant in the model for intermediate science exam pass rates. Earlier specifications and the raw correlations showed a significant and positive relationship between the percent of students in science programs and science exam pass rates.

Table 11.
Intermediate Exam Results

Independent Variable	Estimated Coefficients (t Values)		
	Arts		
	Female	Male	Science
Intercept	89.21821 **	52.77211 **	11.67240
	(5.08)	(3.33)	(0.94)
Number of Students Taking Exam	-0.02081	-0.02229	-0.08657 **
	(-0.69)	(-1.03)	(-1.99)
Percent of Students In Field (Arts or Science)	-0.45850 **	-0.34155 **	0.05143
	(-2.55)	(-2.23)	(-0.29)
Number of Subjects Offered In Field (Arts or Science)	1.41435	2.06225 **	4.58919 **
	(1.22)	(2.23)	(2.92)
Student-Faculty Ratio	-0.16663	-0.52738 **	-0.43604
	(-0.46)	(-2.50)	(-1.33)
Percent of Faculty Above Grade 17	-0.16725	-0.14536	0.37115
	(-0.52)	(-0.62)	(1.42)
Sind (dummy)	6.27127	16.71332 *	21.50163 **
	(0.60)	(1.94)	(2.01)
Female College (dummy)	-	-	13.54751 **
			(2.01)
Adjusted R-Square	0.20	0.24	0.29
F-Statistic	2.619	4.728	7.000
Number of Observations	38	69	105

Note: The dependent variables are F.A. and F.S. pass rates. ** and * indicate the estimate is different from zero at the 5 and 10 percent levels of probability.

Finally, students in the Sind still perform better than those in other provinces even after controlling for the college characteristics included in the model. The higher pass rates among males on the F.A. exam and of all students on the F.S. exam suggest at least two things: that the Sind has either, or both, higher quality colleges and better students, or that the education standards there are lower and/or the exams easier.

Bachelors Results. Table 12 displays the regression results for the B.A. and B.S. exams. Only two variables are associated with college pass rates: the student faculty ratio in the B.A. regressions, and female colleges in both the B.A. and B.S. regressions.

Students attending colleges with higher student faculty ratios perform worse than other students. The model estimates that the percent of students passing the B.A. exam declines by .88 percentage points when the number of students per faculty increases by one. This suggests that, on average, increasing enrollment in colleges at existing faculty levels will have a deleterious effect on the quality of learning in B.A. programs.

Table 12.
Regression Results for Bachelor Exams

	Estimated Coefficients (t-value)	
Independent Variable	Arts	Science
Intercept	24.124 (1.55)	31.107 (1.64)
Number of Students Taking Exam	-0.001 (-0.26)	0.002 (0.03)
Percent of Students In Field (Arts or Science)	0.242 (1.62)	-0.092 (-0.55)
Number of Subjects Offered In Field (Arts or Science)	0.137 (0.15)	-1.284 (-0.50)
Percent of Expenditure on books and equipment	-0.427 (-0.81)	-0.022 (-0.02)
Percent of Faculty Above Grade 17	0.259 (1.00)	.275 (0.90)
Student-Faculty Ratio	-0.877** (-2.26)	-0.163 (-0.36)
Female College (dummy)	15.71** (3.03)	27.851** (3.72)
Adjusted R-Square	.298	.262
F-Statistic	4.764	3.845
Number of Observations	63	57

Note: ** and * represent significance at the 5 and 10 percent levels of probability.

The exam results of female students explains nearly all the variation in pass rates on both the B.A. and B.S. exams. Holding constant differences among colleges in course offerings, instructional inputs and class size, the pass rates of women are 5.7 and 27.9 percentage points higher than those for males on the B.A. and B.S. exams, respectively.

The absence of any relationship between pass rates and the area specialization of the college, the breadth of courses offered, the "quality" of the faculty, and expenditures on instructional materials indicate that achievement among undergraduates is purely random. In other words, if students pass, they do so as a result of their own effort, not as a result of the quality of their education. This result and the overall poor performance of students probably result from an interrelated set of supply and demand factors. On the supply side, these outcomes may indicate that the average quality of education is so low that most are unable to compensate for it. Moreover, attending college costs students very little (see the following section). They enjoy the status of being students, but since the status costs them and their families very little, there is no built-in compulsion to learn. On the demand side, it may be that exam passes, especially in the arts, are not valued in the labor market and, therefore, students attribute little value to them. All are plausible explanations which many Pakistani educators and researchers have confirmed. This situation, however, throws into question the reasonableness of current large Government investments in these ineffective programs.

5. Revenues and Cost Recovery

In the previous section, we defined unit cost as total recurrent expenditure per student. In so doing, we assumed that what universities spend per student reflects the costs they incur to provide a year of education at a desired level of quality, albeit low. The regression analysis confirmed our assumptions about the factors that explain variations in unit cost among colleges and universities, namely economies of scale and a more intense, but not necessarily more effective, use of resources. However, it is not only the

intensity of input use nor the market prices of inputs that determine expenditure per student. Since most college and university funds are provided by Government, expenditure per student and the quality of education are also in part determined by Government funding decisions and the processes that govern grant requests and approvals. These, combined with low cost recovery, leave colleges and universities under-funded, and do not encourage them to design, plan and undertake quality improvements.

University Revenue. Federal grants constitute 87 percent of university income. Ten universities depend on Government for over 90 percent of their income; only two depend on Government for less than 70 percent of their income (Table A.13). This stands in comparison to a 62 percent average in India, a 65 percent average in the U.K., and a 58 percent average in the U.S. (Shattock and Rigby 1983, Tilak 1989, U.S. Department of Education 1988).[25]

This heavy dependence on federal grants has historically left universities under-funded. Since 1979, when the federal government increased its involvement in higher education, universities have consistently received less than they assess is necessary to provide a university education. Figure 3 illustrates the historical average difference between the grants universities requested[26] and those they received. During each of the eight years between 1979 and 1987, universities received 30 percent less than the amount requested. In response to these suboptimal allocations, universities lower their actual expenditures, but rarely are they as low as the government grant. Therefore, universities run up deficits. Between 1979 and 1987, 11 universities -- we have no data for the others -- ran up an average deficit each of 2.6 million Rs a year (Table A.15). In 1985 and 1986 university deficits averaged 3 percent of university expenditure.

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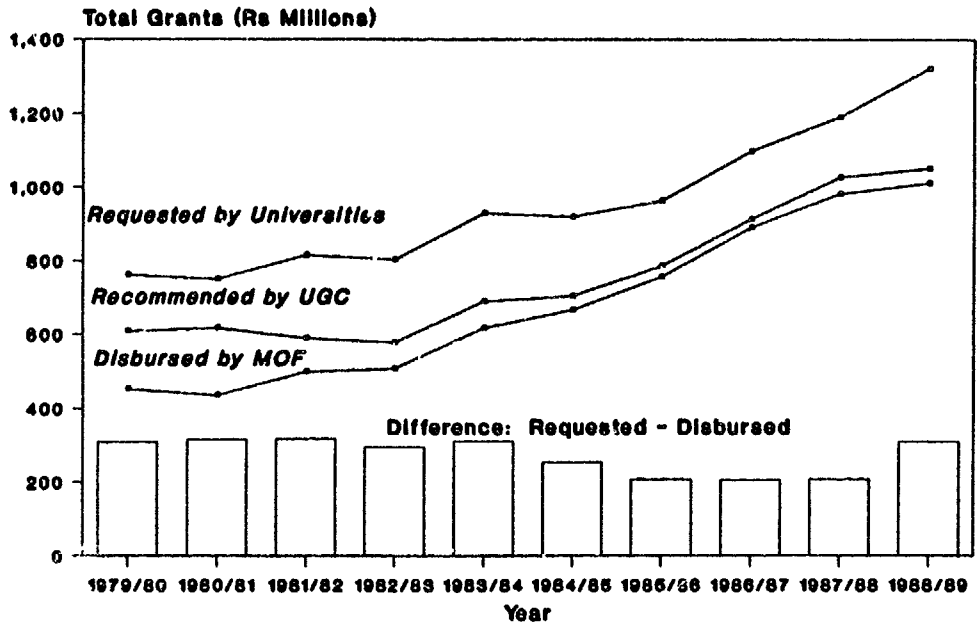
[25] Figures for the U.K. and India are for 1980; the U.S. figure is for 1986.

[26] The size of the grant requested is the university's estimated expenditure net of estimated income from other sources.

Figure 3
Central Government Grants to Universities



University Grant Process. Under-funding is not the only outcome of the sector's dependence on federal grants as its principal and nearly sole source of income. The grant allocation process itself is at best neutral toward, and at worse discourages, university planning, realizing higher standards of achievement, and management and finance improvements.

In the first step of the grant-awarding process, the university submits its estimated budget (which although very detailed, often does not add up) for a federal grant to the UGC. The UGC prepares a recommendation on the size of the grant for final action by the Ministry of Finance. In determining and explaining the recommendation, the UGC reduces the university's detailed budget to a two or three page brief in which only the university's total income and expenditure are discussed, and only in terms of how they compare to the previous year or two. Generally, the UGC recommends a lower grant than that requested by the university and suggests that the university raise more of its own income. The Ministry of Finance then decides on each university's

grant based on the UGC brief, and the available pool of funds for higher education. Typically, the Ministry again cuts the size of the grant. The repeated cuts and simplistic grant allocation process preclude responsiveness to universities' changing needs and make improvements difficult.

Cost Recovery in Universities. The low level of cost recovery in universities compounds the counterproductive effects of the grant process and of their overdependence on government grants. Universities themselves raise only 17 to 20 percent of their income (Table A.13); 55 percent of this income is paid not by university students but by college students in exam fees. Universities with a number of affiliated colleges, such as the Universities of Karachi and Punjab earn over 70 percent of their non-government income from college exam fees. We estimate that fees paid by university students (excluding exam and hostel fees) cover only about 4 percent of unit costs (Table A.14). This is a low level of cost recovery absolutely, and it is lower than that found in other countries in South and East Asia.[27] At this low rate, university students receive a public subsidy of about 18,400 Rs (about $1,058), or about 3 times the 1987 per capita income.

The low level of cost recovery elicits other behavior that damanges the efficiency and effectiveness of universities. Since students do not pay, there is no incentive for them to complete their course of study on time. Many of them don't which raises expenditure per graduate.[28] Students also have less leverage in effecting change. Universities are unlikely to be very responsive to demands for better education when those demands come from the students who invest little in their own education. But the other key player, the Government, demands no standards. The upshot is that universities are not held accountable for the quality of the job they do.

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[27] The World Bank reports user fees as percentage of unit public cost for the following countries: India - 29.1, Indonesia - 13.0, Korea - 23.4, Malaysia - 5.8, Philippines - 3.7, Thailand - 6.9, Turkey - 15.0 (World Bank 1986a).

[28] Completion rates in science programs, for example, stand around 30 percent.

College Revenue and Cost Recovery. Colleges receive most of their revenue from the provincial government. Allocations to individual colleges in each province are based on the number of staff in the college. In addition, a lump sum grant for all nonpersonnel costs and a lump sum grant targeted for library books and periodicals, for chemicals, glassware, and scientific equipment are disbursed to each division for distribution among their colleges. The amounts awarded vary from year to year depending on the availability of provincial resources. They also vary slightly among colleges, although in many cases the divisional grant is simply divided equally among the colleges. In other words, there is no rational formula for distributing these funds.

Within this financing setting, data on income from 99 colleges (44 in the Sind and 55 in the Punjab) show that provincial grants comprise 90 percent of college revenue. Income from fees comprises the remaining 10 percent -- 12 percent in the Sind and 9 percent in the Punjab. This converts to an average annual fee of 300 Rs in the Sind and 200 Rs in the Punjab, and to an average annual subsidy of 2,600 Rs and 2,400 Rs in the Sind and Punjab, respectively.

We also estimated fee revenue for all colleges in the Sind and NWFP provinces using the posted fee schedules, and enrollment and scholarship data.[29] These estimates showed that college students in the Sind pay 330 Rs per year while those in NWFP pay 200 Rs a year. The public subsidy to college students is, therefore, an estimated 2,200 Rs (or 36 percent of per capita income) in the Sind and 3,400 Rs (or 56 percent of per capita income) in the NWFP.

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[29] Tuition and other fees in the Sind range from 275 Rs a year for an intermediate arts student to 450 Rs for a M.S. student, and about 13 percent of all students receive scholarships averaging 525 Rs. In NWFP, fees range from 270 Rs to 365 Rs a year for an intermediate arts and M.S. student, respectively. Students in the Malakand, Sohat, Dir and Chitral Districts pay no fees, and about 12 percent of the remaining students in the province receive scholarships at an average rate of 335 Rs. Using this information and enrollment data, we arrived at estimates of fee income.

Summary and Concluding Remarks. This analysis supports the conclusion that higher education sector as it currently exists in Pakistan is underfunded. University deficits increase annually, and many colleges resemble primary schools with high student teacher ratios, low per student expenditure, and trivial sums spent on operational expenses and instructional materials. This low resource base has had a negative impact on the quality of education, resulting in failure for the majority of college students.

It is not only the low resource base that contributes to the low quality of education, however. Existing resources are also inefficiently used, supporting small high cost colleges, an excessive cadre of servant personnel, and high overhead costs in universities. Faculty and facilities are also less than optimally utilized in many universities. Consolidating small programs, cutting-back on nonessential staff, and increasing the utilization of faculty and facilities could release substantial resources for instructional materials or additional faculty.

Financing and governance practices also contribute to the low resource base and to the inefficient and ineffective use of resources. Cost recovery in colleges and universities is low. Although there is considerable potential to raise student fees, institutions depend heavily on Government funding. Yet, Government neither has standards against which to evaluate the productivity of its investment nor does it inspect institutions' budgets, needs, and resource flows. This cautions against allocating additional public resources to higher education without first instituting mechanisms to rationalize the allocation of resources within and across institutions, linking government grants to performance criteria, targeting additional resources toward the specific needs of individual universities and colleges, and raising revenue from other sources, especially from university fees.

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The Context of Higher Education in Pakistan

Higher education in Pakistan, like that in many developing countries, is the product of two decades of rapid expansion. Between 1970 and 1987 university enrollment increased nearly six fold from about 17,700 to 134,000.[1] Growth in college enrollment was equally robust over this time, although less dramatic because colleges began the 1970s with larger enrollment. In 1970, 238,000 students were enrolled in 238 arts, sciences and professional colleges. By 1987, 449,000 students were studying in one of the 300 or so colleges.

Most post-secondary education is publicly financed. The private sector is small, consisting of 2 universities and about 35 colleges. Most students are enrolled in the 300 plus provincial and federal public colleges and in the 20 public universities. Colleges and universities require the high school F.A. degree for admission to B.A. programs and the F.S. degree for admission to B.S. programs. Competition for undergraduate places is stiff; many applicants are rejected and science majors are often driven into the humanities due to lack of space. Contrary to international practices, the B.A. and B.S. programs require only two years of study after grade 12. Exceptions to this rule are university programs in engineering, pharmacy, and home economics which require four years of study, medicine and dentistry which require five years and honors programs in the sciences which require three years of study. M.A., M.S. and M. Phil. programs are each two years in length; Ph.D. degrees require three years of study after the Masters degree.

Public degree colleges differ from public universities in several respects. Colleges offer both senior high school (grades 11 and 12) and undergraduate programs. The majority of students enrolled (70 percent) are senior high school students. Most degree colleges are sex-segregated; about two-thirds are for males only. They generally offer only Bachelor programs in Arts and/or Sciences, although a few offer Masters degree programs and professional colleges offer specialized programs in education, commerce or home economics.[2]

Provincial governments and their Education Secretariats and Directorates of College Education are responsible for college management,

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[1] The 1987 figure includes enrollment in the Allama Iqbal Open University. Excluding the Open University, enrollment increased from about 17,700 in 1970 to 68,000 in 1987. Figures for 1970 are from World Bank, 1977.

[2] Again, it is unclear precisely how many professional colleges there are. One estimate places them at 92; however, according to our data there appear to be far fewer than that.

setting admissions criteria, and funding.[3] College principals are responsible for day-to-day administration, but they have little decision-making power. The Public Service Commission recruits and selects staff for vacancies.[4] Each college's curriculum and final exams are set by its affiliated university.

The 20 public universities, on the other hand, offer the full range of post-secondary degrees - Bachelors, Masters, M.Phil. and Ph.D.s. All universities are co-educational, though men comprise 70 percent of enrollment. The university population is composed of 7 professional universities, 12 general universities, and the Allama Iqbal Open University (AIOU). The 7 professional universities offer courses of study in agriculture (3 universities) or engineering (4 universities). The 13 general universities differ in the range of fields they offer. For example, the University of Punjab, the University of Peshawar, Gomal University, and Azad Jammu & Kashmir University (AJK) offer a variety of fields including Arts, Science, Education, Law, and Pharmacy. Islamic International specializes in Islamic Studies; Quaid-I-Azam (QIA) is a graduate Arts and Science institution. The Allama Iqbal Open University offers certificate and bachelor degree courses through correspondence, radio, and television at regional teaching centers.

University governance lies with the provincial government which exercises control by appointing the Provincial Governor as university Chancellor. Staff recruitment and selection for universities is ultimately the responsibility of the Public Service Commission; however, university faculty often interview and vote for their preferred candidate. Universities themselves are autonomous in managing their day-to-day affairs. This is done through several statutory bodies - a Senate, a Syndicate, an Academic Council, a Board of Studies, and a Research Board and Finance and Planning Committee. Universities receive most of their funding (about 90 percent) from the federal government through the University Grants Commission.[5] As a result, universities are placed under the financial discipline of the federal government.

Given the financial dependence of colleges and universities on the public budget, in this paper, we investigate the cost of the Pakistani system of higher education and what students actually receive for that expenditure. Specifically, we address the following questions: What are the costs of higher education in Pakistan? What are the components of these costs? What institutional features explain the cost differences among universities and

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[3] This does not apply to the few existing federal colleges located in the federal territories of Islamabad Capital Territory, Federally Administered Tribal and Northern Areas, and in the State of Azad Jammu and Kashmir.

[4] The Public Service Commission is responsible for all civil service hiring; however, principals have the authority to hire staff in the lowest levels of the civil service such as drivers, watchmen, and file clerks.

[5] In 1974, the federal government assumed funding responsibility. Prior to 1974, universities were included in the provincial budgets.

degree colleges? How effective are the institutions, and what factors explain variations in effectiveness? What are other sources of finance for higher education and what is the level of student subsidy?

Data Compilation, Limitations, and Manipulations

In compiling and processing the data for this analysis, we encountered four types of data problems for which we sought acceptable accommodations. First, there were inconsistencies between the data reported in the budgets and those reported in government statistical documents. We proceeded by consistently categorizing and aggregating the data in the budget documents for colleges and universities, and for the latter, across time. All figures were checked against government statistical publications and each discrepancy was investigated. In most cases, government compiled statistics were inconsistently aggregated, and the year the data represented was misreported. For a few others, there were no obvious reasons for the differences and we maintained the consistency of the budget documents.

Second, the year for which data were reported varied across institutions. Among colleges, data for the Karachi region in the Sind province are for 1988/89; those for the remainder of the Sind province and data for the Northwest Frontier Province (NWFP) are for 1987/88. Baluchistan reported figures for 1986/87. All university data pertain to the 1985/86 and 1986/87 academic years. Due to these time differences, all expenditures for colleges and universities were converted to 1987 rupees.

Third, expenditures were not disaggregated by degree level. The budgets were strictly unitary, and college faculty teach both the secondary school students and the undergraduates, and university faculty teach across all levels. This precluded estimating unit expenditures on different levels of education. Because a sizeable proportion of students enrolled in degree colleges are intermediate students (about 70 percent), the unit cost of degree colleges probably understate the cost of undergraduate programs. Similarly, for universities the average costs probably understate the cost of graduate education and reflect those prevailing for undergraduate and certificate programs where 84 percent of university students are enrolled.

Finally, expenditures on salaries and allowances for teaching and nonteaching staff, and income from student fees were often incomplete and inconsistent. Therefore, we estimated faculty and nonfaculty expenditures by assigning to faculty the mid-point salary for their grade and adding 15 percent of base salary to account for allowances. The sum of all faculty salaries was subtracted from total expenditures on personnel to obtain an estimate of nonteaching personnel expenditures. Fee income was estimated by using each university's reported fee schedule and subtracting out freeships and scholarships. For colleges, we used two approaches. For those reporting fee income - 45 colleges in the Sind and 55 in the Punjab - we divided the reported income by enrollment, subtracted out freeships and scholarships and compared the result to the province-wide fee schedules. They compared favorably. To obtain an estimate for colleges in NWFP and for all colleges in the Sind province, we used the posted provincial fee schedules, the reported enrollment by academic level and faculty, and discounted the total by the value of freeships and scholarships awarded. The results for the Sind province were comparable to those obtained using the smaller sample of 45 colleges that had reported actual fee income.

Table A.1: Per Student Expenditures and Other Indicators by College (Expenditures in 1987 Constant Rs)

ID	College	Per Student Expenditure	Student/ Faculty Ratio	Student/ Non-Tch Ratio	% of Budget on Non-Tch Staff	% of Faculty Grades 18+	% of Budget on Non-Personnel	Number of Subjects	% Subjects in Science
14	SIND COLL OF COMM, HYDERABAD	727	130	167	53.7	38.9	5.1	11	9.1
48	G ISLAMIA ART/COMM, SUKKUR	736	79	180	34.1	20.6	4.4	11	0.0
55	G MODEL COLL, MP'KHAS	762	104	127	49.8	18.2	4.6	12	0.0
46	GC GHOTKI	827	74	105	34.6	11.1	7.6	12	41.7
34	GC NAU'FEROZE	848	77	263	39.0	11.8	8.8	15	26.7
27	GC LARKANA	862	58	71	22.3	24.5	6.2	15	40.0
90	S.M. ARTS&COMM	944	81	87	36.3	49.2	1.9	13	7.7
86	G PREMIER C, NAZIMABAD	988	85	73	43.2	32.5	2.4	13	0.0
21	GC KAND-KOT	1020	67	54	37.8	15.4	9.7	12	33.3
106	G ZAMINDAR SC COLL, GUJRAT	1020	38	.	19.5	13.0	10.3	15	40.0
73	GC (W), SAUDABAD	1064	63	63	33.4	3.6	5.4	14	35.7
96	KHURSHEED GC (W)	1103	75	92	43.8	18.8	4.4	9	0.0
85	NATIONAL GOV COLLEGE	1114	74	59	44.7	19.2	2.9	26	50.0
31	G COMM COLL, LARKANA	1120	58	87	38.1	8.3	7.7	4	0.0
36	GC KANDIARO	1169	73	57	51.1	16.7	7.2	15	33.3
26	G S.S. COLL, RANIPUR	1222	71	.	46.7	12.5	13.8	13	53.8
23	G SUP SCI COLL, KH'PUR	1239	56	124	40.9	17.2	8.1	12	41.7
42	G C& S COLL, SH'PUR	1293	47	.	23.6	62.2	8.2	13	30.8
12	GC GHAZALI COLL, LATIFABAD	1302	51	111	40.7	34.6	3.4	14	0.0
72	GC (W), NEW KARACHI	1323	53	51	34.2	14.8	5.9	14	42.9
2	GC , DADU	1346	44	99	32.9	14.8	7.6	11	45.5
99	H.I.OSMANIA GC (W)	1359	58	72	43.2	14.3	3.7	9	0.0
126	GC, SHAKARGARH	1365	17	.	9.4	10.0	18.8	16	37.5
80	GC, SHAHDADPUR	1381	52	50	42.7	19.0	6.7	14	35.7
35	G MEHRAN COLL, MORO	1395	64	40	51.7	20.0	7.9	11	36.4
75	AISHA BAWANY GC	1399	53	40	37.9	18.2	4.3	13	46.2
54	G I.R. (W) COLL, MP'KHAS	1407	46	112	39.5	4.5	7.0	11	36.4
9	GC CITY COLLEGE, HYDERABAD	1473	62	.	53.4	25.0	5.5	16	31.3
59	GC COM & EC	1473	52	.	33.2	51.6	4.4	12	8.3
79	GC ISLAMIA ARTS & COMM	1503	86	62	63.8	22.9	2.3	14	14.3
38	G N.A. TANDO ADAM	1511	51	38	44.0	28.6	7.4	12	41.7
105	G ZAMINDAR COLL, GUJRAT	1511	20	.	23.0	29.9	8.1	15	33.3
28	GC RATODERO	1546	59	37	52.2	15.4	8.8	12	41.7
37	GC SS COLLEGE, N'SHAH	1575	40	.	27.7	66.7	9.4	13	38.5
122	GC, DASKA	1582	20	.	22.3	16.7	10.6	13	30.8
19	GC JA'BAD	1620	37	.	32.6	16.7	9.3	15	33.3
101	RAUNAQ-E-ISLAM GC (W)	1622	38	17	23.9	11.1	6.2	10	0.0
10	GC S.M. COLL TANDO ALLAHYAR	1639	49	36	48.4	17.6	6.9	14	35.7
118	GC (W), SIALKOT	1641	27	41	11.2	33.3	6.7	24	25.0
16	S.A.L. (W) COLL, LATIFABAD	1645	41	55	38.8	18.8	6.4	19	26.3
116	G. ISLAMIC COLL (W), H/ABAD	1652	27	33	18.8	37.5	24.8	8	37.5
175	GC, ASGHAR MALL, R/PINDI	1653	20	.	23.5	42.5	5.9	25	32.0
51	GC (W) SUKKUR	1660	35	48	31.6	18.5	8.1	14	42.9
115	GC (W) WAZIRABAD	1661	27	27	19.3	25.0	22.9	13	30.8
111	GC, GUJRANWALA	1663	24	.	3.5	33.1	7.1	19	26.3
247	GC (W), SARGODHA	1724	28	68	21.8	27.1	4.2	26	23.1
107	G SIR SAYED COLL, GUJRAT	1759	26	.	34.4	17.8	9.1	13	38.5
121	G ALLAMA IQBAL, SIALKOT	1764	22	.	9.8	21.1	11.3	11	45.5
69	G MAHB C ORANGI TOWN	1769	15	36	23.5	15.5	5.9	24	54.2
230	GC W.H. ISL, MULTAN	1772	32	34	29.5	37.5	5.6	.	.
08	GC, MANDI BAHA-UD-DIN	1797	33	.	9.0	23.1	33.3	15	40.0
8	GC S.I. COLLEGE HALA	1815	39	.	37.1	37.5	10.1	16	31.3
04	FC OF COMMERCE, ISLAMABAD	1818	35	.	22.9	15.8	8.3	6	16.7
77	GC CITY COLLEGE	1821	45	48	43.5	16.1	4.5	15	40.0
53	G S.A.L COLL, MP'KHAS	1825	36	41	34.5	37.8	7.3	12	50.0
98	KHATOON-E-PAKISTAN GC (W)	1849	37	38	34.9	10.5	4.2	19	42.1

Table A.1 (continued)

ID	College	Per Student Expenditure	Student/ Faculty Ratio	Student/ Non-Tch Ratio	% of Budget on Non-Tch Staff	% of Faculty Grades 18+	% of Budget on Non-Personnel	Number of Subjects	% Subject in Science
176	GC (W), KEHI NOOR, R/PINDI	1855	21	.	1.1	20.8	11.5	18	33.3
104	GC (W), GUJRAT	1856	24	38	8.5	37.3	9.7	24	29.2
7	GC TANDO MOHD KHAN	1873	38	87	39.9	28.0	7.7	15	33.3
120	G JINNAH ISL, SIALKOT	1880	28	.	33.8	23.7	6.9	13	38.5
124	G MUSLIM COLL (W), NAROWAL	1882	19	27	21.4	17.9	14.3	17	29.4
47	G ISLAMIA SCI, SUKKUR	1886	44	89	51.1	12.5	7.0	12	50.0
123	GC, PASRUR	1899	25	.	38.3	17.4	13.9	12	33.3
32	GC, N'SHAH	1920	35	.	37.1	30.3	8.1	16	31.3
65	GSC LANDI KORANGI	1926	53	27	52.0	20.0	5.6	15	66.7
56	GC TANDO JAN MOHD	1943	42	25	50.8	21.1	7.5	11	45.5
33	GC (W), N'SHAH	1946	31	.	31.7	19.0	8.7	12	25.0
117	GC, HAFIZABAD	1953	24	.	34.5	12.5	13.5	12	41.7
167	GC (W), JHELUM	1959	27	.	24.6	35.7	5.7	25	24.0
29	GC (W) LARKANA	1980	39	.	45.8	0.0	10.7	11	18.2
165	GC, JHELUM	1985	33	.	23.5	53.3	5.9	22	36.4
94	ABDULLAH GC (W)	1997	37	49	40.1	14.9	2.3	24	29.2
100	PECHS GC (W)	2014	39	82	41.9	25.0	2.7	22	36.4
112	G ISLAMIA COLL, GUJRANWALA	2040	27	.	28.2	29.3	9.2	14	35.7
114	G M.Z.ALI KHAN W/ABAD	2042	24	.	12.3	23.5	14.8	11	45.5
171	GC,GUJAR KHAN	2043	30	.	26.5	32.0	13.6	19	26.3
256	GC, BHAKKAR	2043	23	50	18.9	18.0	6.0	19	31.6
70	GC (W) FRERE RD	2061	35	.	32.1	35.9	2.9	25	40.0
102	SIR SAYED GC (W)	2068	38	135	40.9	25.8	2.6	25	28.0
113	GC (W), GUJRANWALA	2071	22	41	7.1	34.3	10.5	26	26.9
174	G V.N.C. (W) R/PINDI	2083	26	.	27.8	33.0	3.3	25	32.0
110	G I.D.JANJUA(W), L/MUSA	2091	12	27	21.6	13.3	13.6	14	28.6
92	ST. PATRICK'S GC	2100	40	38	45.3	13.3	4.7	19	47.4
251	GC, JAUHARABAD	2111	28	42	32.3	31.4	6.7	17	23.5
1	G ISLAMIA COLL, BADIN	2123	38	26	46.3	11.1	10.4	12	33.3
162	GC, CHAKWAL	2126	27	.	29.3	34.6	5.8	21	33.3
290	GC, QUETTA	2152	24	36	11.5	28.0	16.5	22	36.4
81	JAMIA MILLIA GC	2190	35	25	35.3	47.3	4.7	18	38.9
125	G ISLAMIC COLL, NAROWAL	2200	22	.	30.1	15.2	15.4	11	36.4
39	GC, SANGHAR	2217	38	92	49.4	22.7	7.6	13	38.5
57	GC UMERKOT	2217	45	20	54.1	9.1	10.0	10	50.0
103	ST.JOSEPH'S GC (W)	2217	34	36	37.5	24.1	4.7	21	42.9
300	FC FOR MEN, H-8 ISLAMABAD	2252	18	.	5.2	26.4	7.6	18	38.9
13	GC S.S. COMM COLL, HYDERABAD	2271	46	.	58.7	23.1	4.4	8	12.5
283	GSSC NOWSHERA	2272	37	.	51.3	34.4	4.7	16	37.5
291	GC SCI, QUETTA	2273	25	25	23.6	31.8	10.3	15	53.3
274	GC TIMERGARA	2277	35	.	45.6	7.4	10.8	14	35.7
284	GC CHARSADDA	2310	31	.	44.5	34.1	4.1	17	41.2
71	GC (W), NAZIMABAD	2351	37	40	44.7	39.5	3.2	19	31.6
95	G ISLAMIA COLL (W)	2385	31	53	38.1	28.2	3.5	19	10.5
246	GC, SARGODHA	2391	29	37	41.7	44.4	4.0	23	26.1
83	JINNAH GC, NAZIMABAD	2422	35	38	44.7	29.4	3.9	17	41.2
93	SIRAJUDDAULLAH GC	2442	31	33	35.8	31.8	4.5	15	40.0
278	GC SWABI	2504	28	.	47.1	25.7	2.6	15	40.0
43	G. S.A.L. COLL, SH'PUR	2508	36	.	55.5	27.3	4.2	9	0.0
292	GC (W), QUETTA	2515	27	35	35.1	26.0	8.3	22	31.8
264	GC HARIPUR	2521	33	.	52.0	31.3	3.9	17	35.3
25	GC (W), KH'PUR	2560	27	.	36.0	16.7	11.8	14	28.6
44	GC (W), SH'PUR	2614	39	.	50.1	72.7	10.2	6	66.7
168	GORDON COLLEGE, R/PINDI	2631	21	.	25.6	36.5	6.2	20	35.0
302	FC (W), F-7/2,ISLAMABAD	2631	18	.	16.6	24.1	8.3	24	29.2
119	G MURRAY COLL, SIALKOT	2685	22	.	35.8	26.1	6.4	13	38.5
288	GC MATTA	2699	31	.	54.0	24.0	3.5	6	0.0

Table A.1 (continued)

ID	College	Per Student Expenditure	Student/ Faculty Ratio	Student/ Non-Tch Ratio	% of Budget on Non-Tch Staff	% of Faculty Grades 18+	% of Budget on Non-Personnel	Number of Subjects	% Subjects in Science
289	GC DAGGAR	2768	25	.	41.7	18.2	6.9	13	46.2
159	GC, ATTOCK	2792	23	.	26.3	51.1	14.7	23	30.4
287	GJC SAIDU SHARIF	2821	30	.	53.2	29.0	3.7	17	41.2
271	GC MANSEHRA	2828	23	.	42.3	26.3	4.2	16	43.8
97	KARACHI COLLEGE (W)	2849	29	38	43.3	24.6	2.6	23	30.4
248	G.A.M.C., SARGODHA	2897	21	37	35.8	27.9	6.0	20	25.0
18	KBMS (W) COLL, HYDERABAD	2909	32	59	56.3	20.0	3.4	9	0.0
67	GSC LIAQUATABAD	2941	35	25	51.6	34.5	5.0	12	58.3
58	GC THATTA	2942	29	21	46.1	34.8	7.8	13	38.5
267	GC KARAK	2971	23	.	41.2	27.3	7.2	17	35.3
91	S.M. GSC	2994	29	22	45.0	28.1	4.0	15	66.7
45	GC, SUKKUR	3001	24	.	44.4	32.1	5.0	17	41.2
303	FG MARGALLA (W), F-74, ISLAMABAD	3023	16	.	19.5	19.7	9.1	23	30.4
74	ADAMJEE GSC	3051	30	13	45.8	23.3	6.0	17	64.7
169	GC SATELLITE TOWN, R/PINDI	3051	22	.	35.7	57.4	5.7	20	35.0
276	GC DARGAI	3051	22	.	41.8	24.0	5.0	14	42.9
64	G SUPERIOR SC COLLEGE	3054	24	15	30.4	48.6	5.8	19	63.2
249	GC, BHALWAL	3064	19	24	32.4	5.7	8.1	13	30.8
252	GC, MIANWALI	3124	18	28	27.9	36.7	6.1	20	35.0
22	G MUMTAZ COLL, KH'PUR	3140	29	24	56.2	14.3	4.5	10	0.0
260	GC D.I. KHAN	3196	27	.	53.0	31.1	3.9	16	37.5
173	GC (W), R/PINDI	3263	16	.	15.9	51.2	9.2	27	29.6
262	GC (W) D.I.KHAN	3285	22	.	46.1	20.0	3.8	15	40.0
84	LIAQUAT GC	3300	23	26	40.1	20.5	4.0	18	33.3
5	GC (W) HYDERABAD	3306	30	.	55.9	39.0	5.1	21	33.3
263	GC ABBOTTABAD	3313	22	.	43.4	42.0	3.5	17	35.3
89	RLAK COLL OF H.E. (W)	3334	26	19	44.4	16.2	5.6	11	18.2
68	GSC MALIR	3335	26	19	45.2	15.6	6.0	15	26.7
50	A.N. (W) COLL, SUKKUR	3345	31	.	60.9	0.0	7.2	6	0.0
63	GC FOR MEN NAZIMABAD	3361	28	19	47.7	41.7	3.0	20	45.0
166	GC, P.D. KHAN	3367	29	.	23.2	33.3	7.0	18	27.8
88	PECHS ED FDN COLLEGE	3413	30	16	52.9	14.3	5.4	10	40.0
279	GC KHAIRABAD	3442	20	.	40.4	26.1	6.3	13	46.2
259	GC LAKKI	3464	23	.	49.4	26.5	4.3	17	35.3
109	GC, MANDI (W) BAHA-UD-DIN	3478	12	15	4.7	14.7	9.8	19	21.1
6	GC, LATIFABAD	3483	59	92	76.2	54.5	4.0	15	40.0
82	JAMIA MILLIA GC OF ED	3506	18	23	25.8	13.3	7.6	3	33.3
20	GC (W) JA'BAD	3507	22	8	41.0	18.2	13.0	9	33.3
87	PAK SHIPOWNER GC, N.NAZIMABAD	3526	26	22	48.9	22.4	3.3	17	70.6
261	GC TANK	3546	24	.	52.9	28.0	4.0	16	43.8
170	GC, MURREE	3548	21	.	20.9	25.0	16.3	17	29.4
275	GC THANA	3570	19	.	43.7	23.8	4.6	16	37.5
62	D.J. SIND GSC	3580	25	27	44.8	36.0	4.0	19	63.2
172	GC (W),GUJAR KHAN	3585	12	.	35.3	11.1	6.2	14	42.9
277	GC MARDAN	3606	19	.	46.0	23.5	2.7	17	35.3
80	GC ISLAMIA SCIENCE	3615	23	15	46.7	19.2	2.8	19	68.4
161	GC, (W) ATTOCK	3643	16	.	27.6	33.3	9.2	22	36.4
78	HAJI ABDULLAH HAROON GC	3667	50	21	72.0	33.3	3.3	14	42.9
285	GFC (W) PESHAWAR	3858	20	.	50.0	28.1	2.5	20	30.0
164	GC (W), CHAKWAL	3891	26	.	22.9	28.6	8.4	18	27.8
163	GC, TALAGANG	3909	19	.	43.8	33.3	6.8	18	27.8

Table A.1 (continued)

ID	College	Per Student Expenditure	Student/ Faculty Ratio	Student/ Non-Tch Ratio	% of Budget on Non-Tch Staff	% of Faculty Grades 18+	% of Budget on Non-Personnel	Number of Subjects	% Subject in Science
293	GC, LORALAI	3912	11	12	4.8	24.3	9.5	18	38.9
254	GC, ISAKHEL	3918	12	10	5.5	34.8	17.5	12	33.3
301	FC FOR MEN, H-9 ISLAMABAD	3947	16	.	37.2	22.7	6.1	19	36.8
286	GC (W) NOWSHERA	3969	23	.	55.0	5.9	6.3	13	38.5
11	GC S.S. ARTS COLL, HYDERABAD	4020	25	28	58.2	44.4	4.0	10	0.0
160	GC, PINDI GHEB	4085	18	.	39.3	26.3	12.7	19	26.3
3	GC (W), DADU	4148	27	30	56.8	12.5	12.0	7	42.9
269	GC HANGU	4154	17	.	42.2	25.0	5.8	16	31.3
258	GC BANNU	4219	16	.	41.6	33.3	3.3	17	35.3
253	GC, (W) MIANWALI	4314	11	16	7.6	25.0	14.8	17	35.3
265	GC (W) ABBOTTABAD	4344	20	.	56.2	33.3	2.1	17	35.3
60	GC OF ED, F.B. AREA	4352	15	.	29.5	20.5	5.0	8	37.5
272	GC (W) MANSHERA	4372	15	.	37.5	17.6	8.1	12	33.3
4	GC, HYDERABAD	4373	32	.	66.8	50.8	5.4	14	42.9
268	GC KOHAT	4390	18	.	49.9	26.5	3.9	17	35.3
296	GC, USTA MUHAMMAD	4403	13	13	26.8	19.4	8.8	15	46.7
282	GSSC PESHAWAR	4473	19	.	50.0	37.8	6.1	16	43.8
66	GSC LYARI	4506	22	15	47.1	34.6	6.2	12	66.7
250	GC, SHAHPUR SADAR	4583	16	15	41.2	23.1	10.8	13	30.8
298	GC, TURBAT	4683	15	13	32.6	18.5	16.7	17	29.4
280	GC (W) MARDAN	4754	13	.	38.8	23.3	4.7	18	38.9
270	GC (W) KOHAT	4805	13	.	41.1	16.0	3.8	16	37.5
281	GC PESHAWAR	5008	18	.	58.1	30.9	2.3	22	27.3
273	GC CHITRAL	5107	16	.	37.9	33.3	8.9	13	46.2
297	GC, KHUZDAR	5173	12	12	26.9	16.1	11.5	16	31.3
52	G ED COLL, SUKKUR	5239	24	.	67.1	15.0	4.9	13	15.4
257	GC, (W) BHAKKAR	5269	8	9	20.5	30.0	17.9	14	35.7
266	GC (W) HARIPUR	5288	22	.	65.7	29.6	2.7	16	37.5
127	G ISLAMIC COLL, BADDOMALHI	5435	12	.	58.1	5.6	11.9	12	33.3
255	GC, LIAQUATABAD	5642	10	11	21.2	20.8	13.7	13	38.5
24	G PAK COLL, KH'PUR	6005	10	28	34.6	18.2	6.1	9	0.0
295	GC, ZHOB	6104	14	9	39.5	12.5	17.1	15	40.0
76	ALLAMA IQBAL GC	6119	12	13	38.7	14.5	3.5	19	31.6
17	MB&GF (W) COLL,HYDERABAD	6791	11	38	48.7	29.4	3.3	10	0.0
49	A.H. SHAH COLL, ROHRI	7112	12	38	48.0	20.0	5.4	10	0.0
41	GC (W), SANGHAR	7124	18	.	64.0	10.0	7.8	8	12.5
294	GC, SIBI	7396	9	7	25.4	25.0	14.9	18	33.3
15	DR.I.H. ZUBERI H.E.COLL, HYDERABAD	8884	10	9	49.3	30.0	8.2	12	25.0
299	GC, MASTUNG	9396	11	6	51.8	35.3	10.6	17	35.3
61	GC PHYS ED, U RD	9457	10	.	43.4	11.1	11.7	4	25.0
	All	2853	32	46	37.8	25.5	7.4	15	33.2
	General	2799	31	45	37.5	25.8	7.5	16	34.1
	Professional	3791	42	63	43.3	20.4	6.4	9	17.5
	Sind	2567	42	54	44.0	24.3	6.1	14	32.1
	Punjab	2605	22	30	24.1	27.9	10.7	17	32.6
	NWFP	3600	23	.	47.3	26.4	4.7	16	36.9
	Baluchistan	4801	16	17	27.8	23.7	12.4	18	37.6
	Islamabad	2734	21	.	20.3	21.7	7.9	18	30.4

Table A.2: Distribution of University Personnel Expenditures, 1985/86 and 1986/87

1985/86	Unit Cost	Percent of Recurrent Expenditure on: All Personnel	Faculty	Non-teaching Staff	Administrative Staff
1 AZAD JAMMU & KASHMIR	26,248	70.0	35.6	25.6	8.8
2 B. Z. MULTAN	15,995	52.4	19.4	28.3	4.7
3 GOMAL UNIVERSITY	14,028	74.8	31.8	40.1	2.9
4 ISLAMIA U.BAHAWALPUR	15,406	64.4	27.1	34.0	3.3
5 ISLAMIC INTERNATIONAL	29,267	43.7	12.1	21.9	9.7
6 QUAID-I-AZAM UNIV.	37,430	70.6	39.2	26.3	5.1
7 SHAH ABDUL LATIF	7,015	81.4	33.6	40.0	7.8
8 UNIV. OF BALUCHISTAN	14,432	72.3	31.3	33.6	7.4
9 UNIVERSITY OF KARACHI	10,679	58.6	31.8	22.4	4.5
10 UNIVERSITY OF PESHAWAR	8,623	70.6	39.2	28.2	3.3
11 UNIVERSITY OF PUNJAB	13,050	58.5	22.5	32.3	3.7
12 UNIVERSITY OF SIND	22,279	61.6	30.3	28.2	3.1
13 AGRICULTURE FAISALABAD	15,716	68.5	31.7	34.2	2.6
14 NWFP AGRICULTURE	32,019	68.3	37.3	22.3	8.7
15 SIND AGRICULTURE	19,220	71.4	33.6	33.8	4.0
16 ENGINEERING LAHORE	11,843	69.2	31.6	33.6	4.0
17 MEHRAN ENGINEERING	13,162	64.3	30.0	28.9	5.5
18 NED ENGINEERING	7,543	57.1	20.7	29.8	6.5
19 NWFP ENGINEERING	16,774	60.2	27.6	29.0	3.6
All	17,407	65.2	29.8	30.1	5.2
General	17,871	64.9	29.5	30.1	5.4
Agriculture	22,318	69.4	34.2	30.1	5.1
Engineering	12,331	62.7	27.5	30.3	4.9
1986/87					
1 AZAD JAMMU & KASHMIR	37,105	68.0	35.0	20.8	12.3
2 B. Z. MULTAN	18,911	58.5	18.9	34.1	5.5
3 GOMAL UNIVERSITY	12,841	75.9	32.4	39.7	3.8
4 ISLAMIA U.BAHAWALPUR	14,083	68.2	30.4	34.5	3.4
5 ISLAMIC INTERNATIONAL	49,579	50.9	13.4	26.7	10.9
6 QUAID-I-AZAM UNIV.	34,179	65.6	38.9	20.5	6.3
7 SHAH ABDUL LATIF	8,169	74.1	34.3	28.8	11.0
8 UNIV. OF BALUCHISTAN	14,503	77.8	42.0	29.4	6.5
9 UNIVERSITY OF KARACHI	12,182	57.7	30.6	22.4	4.7
10 UNIVERSITY OF PESHAWAR	9,560	74.2	42.8	28.1	3.2
11 UNIVERSITY OF PUNJAB	14,886	60.6	23.5	35.5	1.6
12 UNIVERSITY OF SIND	27,376	54.1	25.5	26.1	2.5
13 AGRICULTURE FAISALABAD	18,546	71.1	35.2	33.1	2.8
14 NWFP AGRICULTURE	35,107	66.7	39.5	22.3	5.0
15 SIND AGRICULTURE	27,681	66.8	32.9	28.9	5.0
16 ENGINEERING LAHORE	15,229	70.6	32.2	34.2	4.1
17 MEHRAN ENGINEERING	15,692	62.4	29.2	28.6	4.6
18 NED ENGINEERING	10,845	56.3	25.7	25.2	5.5
19 NWFP ENGINEERING	21,767	52.4	24.3	24.8	3.3
All	20,960	64.8	30.9	28.6	5.4
General	21,115	65.5	30.6	28.9	6.0
Agriculture	27,111	68.2	35.8	28.1	4.3
Engineering	15,883	60.4	27.9	28.2	4.4

Table A.3: Distribution of University Non-Teaching Personnel by Civil Service Grade, 1985/86

	Non-Teaching Personnel by Grade				Non-Teaching Personnel in Teaching Dep't			
1985/86	1-11 (%)	12-16 (%)	17-22 (%)	Total	1-7 (%)	8-11 (%)	12-16 (%)	Total
1 AZAD JAMMU & KASHMIR	84.5	8.1	7.4	381	.	.	.	.
2 B. Z. MULTAN	89.6	6.8	3.6	604	86.9	6.5	6.5	107
3 GOMAL UNIVERSITY	89.2	9.1	1.7	1031	98.5	0.0	1.5	261
4 ISLAMIA U.BAHAWALPUR	85.8	11.9	2.3	620	90.4	1.9	7.7	104
5 ISLAMIC INTERNATIONAL	78.7	11.8	9.5	592	.	.	.	.
6 QUAID-I-AZAM UNIV.	82.3	13.3	4.4	542	88.3	8.6	3.1	128
7 SHAH ABDUL LATIF	91.7	4.2	4.2	240	.	.	.	.
8 UNIV. OF BALUCHISTAN	80.1	14.8	5.0	674	.	.	.	.
9 UNIVERSITY OF KARACHI	91.0	4.7	4.3	1330	.	.	.	.
10 UNIVERSITY OF PESHAWAR	84.0	13.3	2.7	1448	70.0	9.6	20.5	763
11 UNIVERSITY OF PUNJAB	89.4	8.1	2.6	2939	83.6	5.6	10.8	1331
12 UNIVERSITY OF SIND	92.7	4.9	2.4	1548	.	.	.	.
13 AGRICULTURE FAISALABAD	90.5	7.8	1.7	1929	82.3	9.4	8.4	1198
14 NWFP AGRICULTURE	86.3	5.6	8.1	431	81.2	11.3	7.5	186
15 SIND AGRICULTURE	92.8	4.6	2.6	887	.	.	.	.
16 ENGINEERING LAHORE	85.2	12.1	2.7	1399	64.7	18.0	17.3	510
17 MEHRAN ENGINEERING	91.3	4.6	4.1	761	66.8	30.2	3.0	301
18 NED ENGINEERING	87.8	7.4	4.8	607	53.1	27.6	19.4	196
19 NWFP ENGINEERING	85.4	11.8	2.8	458	66.2	12.3	21.5	195
All	87.3	8.7	4.0	18,421	77.7	11.7	10.6	5,280
General	86.6	9.3	4.2	11,949	86.3	5.4	8.4	2,694
Agriculture	89.9	6.0	4.1	3,247	81.7	10.3	7.9	1,384
Engineering	87.4	9.0	3.6	3,225	62.7	22.0	15.3	1,202
1986/87								
1 AZAD JAMMU & KASHMIR	78.2	9.7	12.1	504	80.7	11.0	8.3	327
2 B. Z. MULTAN	89.5	7.0	3.6	674	86.6	6.3	7.1	127
3 GOMAL UNIVERSITY	88.0	9.8	2.2	1099	87.6	7.1	5.4	298
4 ISLAMIA U.BAHAWALPUR	86.5	11.2	2.3	667	80.1	5.6	14.4	341
5 ISLAMIC INTERNATIONAL	81.9	9.4	8.7	658	63.3	23.3	13.3	30
6 QUAID-I-AZAM UNIV.	80.1	13.2	6.8	532	64.2	5.7	30.1	176
7 SHAH ABDUL LATIF	88.8	3.4	7.8	268	.	.	.	.
8 UNIV. OF BALUCHISTAN	79.6	15.4	5.0	735	70.6	6.3	23.1	221
9 UNIVERSITY OF KARACHI	89.5	5.9	4.6	1338	.	.	.	.
10 UNIVERSITY OF PESHAWAR	85.9	11.5	2.6	1491	70.9	10.1	19.1	786
11 UNIVERSITY OF PUNJAB	90.3	8.7	1.0	3068	81.4	5.9	12.7	1444
12 UNIVERSITY OF SIND	92.9	5.0	2.1	1647	.	.	.	.
13 AGRICULTURE FAISALABAD	89.8	8.3	1.9	1935	81.8	9.4	8.8	1212
14 NWFP AGRICULTURE	86.5	8.7	4.9	473	80.8	9.1	10.1	198
15 SIND AGRICULTURE	91.9	4.3	3.8	879	85.6	9.0	5.5	824
16 ENGINEERING LAHORE	82.1	15.1	2.8	1456	64.4	10.6	25.1	531
17 MEHRAN ENGINEERING	87.8	8.6	3.6	977	52.4	33.6	14.1	420
18 NED ENGINEERING	86.7	8.5	4.8	632	62.6	24.6	12.8	382
19 NWFP ENGINEERING	84.6	12.3	3.0	462	66.0	12.0	22.0	209
All	86.3	9.3	4.4	19,495	73.7	11.8	14.5	7,526
General	85.9	9.2	4.9	12,681	76.1	9.0	14.8	3,750
Agriculture	89.4	7.1	3.5	3,287	82.7	9.2	8.1	2,234
Engineering	85.3	11.1	3.5	3,527	61.3	20.2	18.5	1,542

Table A.4: University Enrollment, Unit Costs and Other Indicators 1985/86 and 1986/87

1985/86	Total Enrollment	Unit Cost	Students/ Faculty	Students/ Non-teachers	Percent of: Faculty Grade 18+	Percent of: Graduate Students	Percent of Recurrnt Expenditure: Non-Personnel	Faculty	Non-teaching Staff	Area/ Student (Sqft)
1 AZAD JAMMU & KASHMIR	769	26,248	5	2	13.1	25.2	30.0	41.5	40.1	2.93
2 B. Z. MULTAN	1,723	15,995	14	3	13.2	43.5	47.6	23.7	40.3	17.55
3 GOMAL UNIVERSITY	2,326	14,028	10	2	18.7	22.1	25.2	39.5	53.3	6.96
4 ISLAMIA U.BAHAWALPUR	1,488	15,406	11	2	21.6	66.4	35.6	33.5	46.1	21.61
5 ISLAMIC INTERNATIONAL	534	29,267	6	1	24.6	14.0	56.3	32.1	84.1	16.37
6 QUAID-I-AZAM UNIV.	1,007	37,430	5	2	25.4	81.1	29.4	43.2	34.6	36.23
7 SHAH ABDUL LATIF	1,275	7,015	21	5	6.7	29.7	18.6	34.7	49.3	.
8 UNIV. OF BALUCHISTAN	2,738	14,432	14	4	13.2	49.1	27.7	27.2	35.8	12.27
9 UNIVERSITY OF KARACHI	8,645	10,679	20	7	35.0	43.7	41.4	35.9	30.3	12.86
10 UNIVERSITY OF PESHAWAR	9,265	8,623	17	6	31.1	16.4	29.4	42.2	33.9	11.61
11 UNIVERSITY OF PUNJAB	9,067	13,050	18	3	33.3	40.2	41.5	26.0	41.7	4.45
12 UNIVERSITY OF SIND	4,607	22,279	11	3	31.6	34.5	38.4	28.8	29.7	11.30
13 AGRICULTURE FAISALABAD	4,892	15,716	10	3	25.7	22.2	31.5	37.3	43.4	11.17
14 NWFP AGRICULTURE	687	32,019	4	2	29.3	35.8	31.7	53.5	44.4	8.67
15 SIND AGRICULTURE	1,823	19,220	8	2	26.8	14.6	28.6	40.8	45.9	29.36
16 ENGINEERING LAHORE	5,194	11,843	17	4	46.0	4.9	30.8	37.2	44.3	14.99
17 MEHRAN ENGINEERING	2,755	13,162	14	4	27.4	7.1	35.7	37.4	42.8	14.78
18 NED ENGINEERING	4,024	7,543	38	7	33.3	7.5	42.9	23.4	41.0	4.40
19 NWFP ENGINEERING	1,468	16,774	13	3	37.6	0.0	39.8	27.5	32.4	14.31
All	64,278	17,407	14	3	26.0	29.4	34.8	35.0	42.8	13.99
General	43,444	17,871	13	3	22.3	38.8	35.1	34.0	43.3	14.01
Agriculture	7,402	22,318	7	2	27.3	24.2	30.6	43.9	44.6	16.40
Engineering	13,441	12,331	20	5	36.1	4.9	37.3	31.4	40.1	12.12

Table A.4: continued

1986/87	Total Enrollment	Unit Cost	Students/ Faculty	Students/ Non-teachers	Percent of: Faculty Grade 18+	Percent of: Graduate Students	Percent of Recurrnt Expenditure: Non-Personnel	Faculty	Non-teaching Staff	Area/ Student (Sqft)
1 AZAD JAMMU & KASHMIR	902	37,105	4	2	21.4	16.1	32.0	36.1	34.1	2.50
2 B. Z. MULTAN	2,015	18,911	19	3	14.8	48.0	41.5	14.5	30.6	15.01
3 GOMAL UNIVERSITY	2,549	12,841	10	2	18.6	24.4	24.1	40.6	54.6	6.35
4 ISLAMIA U.BAHAWALPUR	2,215	14,083	13	3	17.6	74.7	31.8	34.0	42.4	14.52
5 ISLAMIC INTERNATIONAL	388	49,579	4	1	21.5	16.2	49.1	26.7	74.9	22.53
6 QUAID-I-AZAM UNIV.	1,277	34,179	5	2	33.9	81.4	34.4	43.0	29.6	28.57
7 SHAH ABDUL LATIF	1,662	8,169	20	6	19.1	29.5	25.9	35.2	40.7	.
8 UNIV. OF BALUCHISTAN	2,750	14,503	9	4	24.2	49.3	22.2	44.1	37.6	12.22
9 UNIVERSITY OF KARACHI	8,128	12,182	19	6	34.0	47.0	42.3	31.1	27.5	13.68
10 UNIVERSITY OF PESHAWAR	9,445	9,560	16	6	34.4	16.9	25.8	37.4	27.4	11.39
11 UNIVERSITY OF PUNJAB	9,423	14,886	18	3	34.9	49.2	39.4	21.1	33.2	4.28
12 UNIVERSITY OF SIND	4,635	27,376	12	3	30.5	35.0	45.9	23.5	26.4	11.23
13 AGRICULTURE FAISALABAD	4,951	18,546	10	3	46.1	26.8	28.9	33.5	34.3	11.03
14 NWFP AGRICULTURE	767	35,107	4	2	34.8	39.0	33.3	52.2	36.0	7.77
15 SIND AGRICULTURE	1,850	27,681	8	2	42.4	14.7	33.2	31.6	32.6	28.93
16 ENGINEERING LAHORE	5,398	15,229	17	4	48.3	4.7	29.4	26.4	31.4	14.43
17 MEHRAN ENGINEERING	4,036	15,692	16	4	28.6	5.4	37.6	27.1	30.7	10.09
18 NED ENGINEERING	4,145	10,845	25	7	32.4	9.4	43.7	30.1	36.0	4.27
19 NWFP ENGINEERING	1,391	21,767	12	3	37.5	0.0	47.6	22.9	26.5	15.10
All	67,927	20,960	13	4	30.3	30.9	35.2	32.2	36.1	12.99
General	45,389	21,115	12	3	25.4	40.6	34.5	32.3	38.2	12.93
Agriculture	7,568	27,111	7	2	41.1	26.8	31.8	39.1	34.3	15.91
Engineering	14,970	15,883	18	5	36.7	4.9	39.6	26.6	31.2	10.97

Table A.5: Means and Standard Deviations of Variables in College Regressions

	Mean	st. dev.
Per student expenditure	2853	1549.86
Enrollment	1207	893.20
Enrollment^{-1}	0.001	0.001
Student-faculty ratio	31.72	18.50
Percent of budget on non-faculty	37.81	14.35
Percent of faculty grades 18 +	25.42	11.99
Number of subjects offered	15.34	4.68
General college (dummy)	.946	.226

Table A.6: Correlation Matrix for Colleges

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Per student exp.							
(2) Enrollment^{-1}	-.489						
(3) Enrollment^{-1}	.740						
(4) Student/faculty ratio	-.632	.440	-.400				
(5) Faculty grade 18+	-.000	.273	-.233	-.024			
(6) Percent expend on non-faculty	.225	-.092	.093	.283	-.052		
(7) Number of subjects	-.075	.484	-.436	-.204	.318	-.305	
(8) General college	-.145	.071	-.202	-.127	.101	-.092	.353

Table A.7: Means and Standard Deviation of Variables in University Regressions

Variable	Mean	St. Dev.
Per student expenditure	19,183.4	9,976.13
Enrollment	3,479.3	2,815.23
Enrollment^{-1}	.0005	.0005
Student-faculty ratio	13.1	6.97
Student-non-teaching staff ratio	3.4	1.69
Percenr of faculty grades 19+	28.1	9.91
Percent of graduate students	30.1	21.88
Percent of expenditure onnonpersonnel	35.0	8.38

Table A.8: Correlation Matrix For Universities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Per student expenditure								
(2) Enrollment	-0.532							
(3) Enrollment^{-1}	0.775	-0.689						
(4) Students/faculty	-0.752	0.493	-0.590					
(5) Students/non-teaching staff	-0.713	0.579	-0.590	0.828				
(6) Faculty grades 18+	-0.006	0.448	-0.322	0.113	0.167			
(7) % graduate students	0.164	-0.050	0.020	-0.210	-0.177	-0.314		
(8) % expenditure on nonpersonnel	0.271	0.022	0.240	0.116	-0.078	0.169	-0.118	
(9) Year	0.180	0.0345	-0.029	-0.057	0.016	0.219	0.036	0.019

Table A.9: Area of Universities in Square Feet Relative to Enrollment, 1985/86 and 1986/87

1985/86	Unit Cost	Total Area/ Student	Academic Area/ Student	Class Area/ Student	Hostel Area/ Student
1 AZAD JAMMU & KASHMIR	26,248	226.4	42.3	2.9	58.4
2 B. Z. MULTAN	15,995	171.9	98.2	17.6	73.7
3 GOMAL UNIVERSITY	14,028	220.7	44.9	7.0	83.8
4 ISLAMIA U.BAHAWALPUR	15,406	417.1	164.3	27.1	125.1
5 ISLAMIC INTERNATIONAL	29,267	304.8	81.5	16.4	113.5
6 QUAID-I-AZAM UNIV.	37,430	783.5	401.7	36.2	194.7
7 SHAH ABDUL LATIF	7,015				
8 UNIV. OF BALUCHISTAN	14,432	165.1	98.1	12.3	35.1
9 UNIVERSITY OF KARACHI	10,679	89.9	39.2	12.9	29.9
10 UNIVERSITY OF PESHAWAR	8,623	281.7	44.4	11.6	47.1
11 UNIVERSITY OF PUNJAB	13,050	342.2	92.7	4.5	125.2
12 UNIVERSITY OF SIND	22,279	376.1	118.6	11.3	104.3
13 AGRICULTURE FAISALABAD	15,716	734.7	87.9	11.2	121.4
14 NWFP AGRICULTURE	32,019	454.4	148.4	8.7	247.4
15 SIND AGRICULTURE	19,220	453.5	193.7	29.4	196.9
16 ENGINEERING LAHORE	11,843	403.0	110.3	15.0	132.3
17 MEHRAN ENGINEERING	13,162	233.2	61.2	14.8	141.4
18 NED ENGINEERING	7,543	114.8	52.5	4.4	45.4
19 NWFP ENGINEERING	16,774	385.7	185.1	14.3	159.3
All	17,407	342.2	114.7	14.3	113.0
General	17,971	307.2	111.4	14.5	90.1
Agriculture	22,318	547.5	143.3	16.4	188.6
Engineering	12,331	284.2	102.3	12.1	119.6
1986/87					
1 AZAD JAMMU & KASHMIR	37,105	193.0	36.1	2.5	49.8
2 B. Z. MULTAN	18,911	147.0	84.0	15.0	63.0
3 GOMAL UNIVERSITY	12,841	201.4	41.0	6.3	76.5
4 ISLAMIA U.BAHAWALPUR	16,375	260.1	102.5	16.9	78.0
5 ISLAMIC INTERNATIONAL	49,579	419.5	112.1	22.5	156.2
6 QUAID-I-AZAM UNIV.	34,179	617.9	316.7	28.6	153.5
7 SHAH ABDUL LATIF	8,169				
8 UNIV. OF BALUCHISTAN	14,503	164.4	97.7	12.2	34.9
9 UNIVERSITY OF KARACHI	12,182	95.6	41.7	13.7	31.8
10 UNIVERSITY OF PESHAWAR	9,560	276.3	43.5	11.4	46.2
11 UNIVERSITY OF PUNJAB	14,886	329.3	89.2	4.3	120.5
12 UNIVERSITY OF SIND	27,376	373.8	117.8	11.2	103.6
13 AGRICULTURE FAISALABAD	18,546	725.9	86.8	11.0	120.0
14 NWFP AGRICULTURE	35,107	407.0	132.9	7.8	221.6
15 SIND AGRICULTURE	27,681	446.9	190.9	28.9	194.0
16 ENGINEERING LAHORE	15,229	387.8	106.1	14.4	127.3
17 MEHRAN ENGINEERING	15,692	159.2	41.7	10.1	96.5
18 NED ENGINEERING	10,845	111.5	51.0	4.3	44.1
19 NWFP ENGINEERING	21,767	407.1	195.3	15.1	168.1
All	20,960	318.0	104.8	13.1	104.8
General	21,115	279.8	98.4	13.1	83.1
Agriculture	27,111	526.6	136.9	15.9	178.5
Engineering	15,883	266.4	98.5	11.0	109.0

Table A.10: Means and Standard Deviations of Variables in Exam Regressions

Variable	N	Mean	St. Dev.
Pass rate: Arts	110	42.3	22.234
Pass rate: Science	107	38.5	29.468
Number sat for arts exam	110	196.0	133.010
Number sat for science exam	107	74.0	72.533
Percent enrolled in Arts	194	51.2	31.844
Percent enrolled in Science	194	41.3	31.019
Number of arts subjects offered	203	10.0	3.439
Number of science subjects offered	203	5.0	2.619
Student-faculty ratio	204	32.0	18.503
Percent of faculty above grade 17	204	25.5	11.988

Table A.11: Correlation Matrix for Variables Used in Arts Exam Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Pass rate: Arts								
(2) Number of students who sat for Arts exam	0.131							
(3) Percent of students enrolled in Arts	-0.119	0.0234						
(4) Number of Arts subjects	0.312	0.547	0.374					
(5) Student-faculty ratio	0.019	0.310	-0.362	-0.098				
(6) Percent of faculty at grade 18 or higher	-0.056	0.157	-0.070	0.275	-0.024			
(7) Percent of expenditure for non-personnel	-0.252	-0.255	0.163	-0.165	-0.225	-0.141		
(8) Sind (dummy)	0.383	0.238	-0.566	-0.306	0.547	-0.101	-0.319	
(9) Female college (dummy)	0.557	0.276	0.429	0.294	-0.113	-0.115	-0.003	0.011

Table A.12: Correlation Matrix for Variables Used in Science Exam Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Pass rate: Science								
(2) Number of stdts that sat for Science exam	-0.245							
(3) Percent of students enrolled in Science	0.177	0.303						
(4) Number of Science subjects	0.409	0.149	0.446					
(5) Student-faculty ratio	-0.044	0.063	0.017	-0.235				
(6) Percent of faculty at grade 18 or higher	0.118	0.346	0.036	0.206	-0.0240			
(7) Percent of expenditure for non-personnel	0.026	-0.327	-0.035	-0.072	-0.225	-0.141		
(8) Sind (dummy)	0.326	-0.149	0.339	-0.183	0.546	-0.101	-0.319	
(9) Female college (dummy)	0.190	-0.299	-0.290	-0.054	-0.113	-0.115	-0.003	0.011

Table A.13. Sources of University Income (in percent)

ID	Name	Gov't Grant	Own Resources	Other Income	Interest Income	Total
1985/86						
1	AZAD JAMMU & KASHMIR	84.3	15.7	0.0	0.0	100
2	B. Z. MULTAN	70.0	24.4	4.9	0.7	100
3	GOMAL UNIVERSITY	92.8	5.4	1.9	0.0	100
4	ISLAMIA U.BAHAWALPUR	92.3	7.7	0.0	0.0	100
5	ISLAMIC INTERNATIONAL	90.6	4.2	5.2	0.0	100
6	QUAID-I-AZAM UNIV.	85.5	8.1	0.0	6.4	100
7	SHAH ABDUL LATIF	93.5	6.5	0.0	0.0	100
8	UNIV. OF BALUCHISTAN	88.0	12.0	0.0	0.0	100
9	UNIVERSITY OF KARACHI	75.9	23.5	0.6	0.0	100
10	UNIVERSITY OF PESHAWAR	79.1	16.1	4.9	0.0	100
11	UNIVERSITY OF PUNJAB	63.6	35.4	0.5	0.4	100
12	UNIVERSITY OF SIND	81.0	18.1	0.9	0.0	100
13	AGRICULTURE FAISALABAD	85.6	2.9	6.2	5.2	100
14	NWFP AGRICULTURE	91.1	8.9	0.0	0.0	100
15	SIND AGRICULTURE	89.0	9.5	0.0	1.4	100
16	ENGINEERING LAHORE	85.9	6.8	7.0	0.4	100
17	MEHRAN ENGINEERING	91.0	9.0	0.0	0.0	100
18	NED ENGINEERING	92.6	6.8	0.0	0.5	100
19	NWFP ENGINEERING	88.3	11.7	0.0	0.0	100
20	ALLAMA IQBAL OPEN UNIV	71.5	27.8	0.6	0.2	100
	Total	84.6	13.0	1.6	0.8	100
	General	83.0	14.8	1.6	0.6	100
	Agricultural	88.6	7.1	2.1	2.2	100
	Engineering	89.4	8.6	1.8	0.2	100
	Open University	71.5	27.8	0.6	0.2	100
1986/87						
1	AZAD JAMMU & KASHMIR	76.1	23.9	0.0	0.0	100
2	B. Z. MULTAN	70.4	23.8	4.9	0.9	100
3	GOMAL UNIVERSITY	94.8	5.2	0.0	0.0	100
4	ISLAMIA U.BAHAWALPUR	92.9	7.1	0.0	0.0	100
5	ISLAMIC INTERNATIONAL	94.3	5.7	0.0	0.0	100
6	QUAID-I-AZAM UNIV.	92.1	6.1	0.0	1.8	100
7	SHAH ABDUL LATIF	92.2	7.8	0.0	0.0	100
8	UNIV. OF BALUCHISTAN	90.5	9.5	0.0	0.0	100
9	UNIVERSITY OF KARACHI	84.1	15.9	0.0	0.0	100
10	UNIVERSITY OF PESHAWAR	82.0	13.5	4.4	0.0	100
11	UNIVERSITY OF PUNJAB	66.1	32.3	1.2	0.3	100
12	UNIVERSITY OF SIND	84.1	14.8	1.1	0.0	100
13	AGRICULTURE FAISALABAD	90.2	2.1	4.8	2.8	100
14	NWFP AGRICULTURE	91.7	8.3	0.0	0.0	100
15	SIND AGRICULTURE	90.8	7.9	0.0	1.2	100
16	ENGINEERING LAHORE	91.2	8.8	0.0	0.0	100
17	MEHRAN ENGINEERING	92.0	8.0	0.0	0.0	100
18	NED ENGINEERING	95.5	4.5	0.0	0.0	100
19	NWFP ENGINEERING	90.8	9.2	0.0	0.0	100
20	ALLAMA IQBAL OPEN UNIV	69.5	29.2	0.7	0.6	100
	Total	86.6	12.2	0.9	0.4	100
	General	93.6	4.8	1.0	0.2	100
	Agricultural	90.0	6.0	1.6	1.4	100
	Engineering	92.4	7.6	0.0	0.0	100
	Open University	69.2	29.7	0.7	0.6	100

Table A.14. Average Fees and Fee Income of Universities, 1985/86 and 1986/87

	1985/86				1986/87			
			Fee Income				Fee Income	
	Average Fee	Fees as % of Unit Cost	Per Student	as a % of Unit Cost	Average Fee	Fees as % of Unit Cost	Per Student	as a % of Unit Cost
1 AZAD JAMMU & KASHMIR	544	2.1	309	1.2	508	1.4	228	0.6
2 B. Z. MULTAN	898	5.6	919	5.7	840	4.4	849	4.5
3 GOMAL UNIVERSITY	710	5.1	481	3.4	664	5.2	453	3.5
4 ISLAMIA U.BAHAWALPUR	636	4.1	555	3.6	595	4.2	514	3.7
5 ISLAMIC INTERNATIONAL	736	2.5	278	0.9	688	1.4	285	0.6
6 QUAID-I-AZAM UNIV.	491	1.3	382	1.0	459	1.3	357	1.0
7 SHAH ABDUL LATIF	392	5.6	343	4.9	367	4.5	319	3.9
8 UNIV. OF BALUCHISTAN	595	4.1	262	1.8	557	3.8	226	1.6
9 UNIVERSITY OF KARACHI	238	2.2	236	2.2	222	1.8	229	1.9
10 UNIVERSITY OF PESHAWAR	394	4.6	227	2.6	368	3.9	207	2.2
11 UNIVERSITY OF PUNJAB	339	2.6	291	2.2	317	2.1	277	1.9
12 UNIVERSITY OF SIND	487	2.2	415	1.9	456	1.7	389	1.4
13 AGRICULTURE FAISALABAD	350	2.2	376	2.4	328	1.8	349	1.9
14 NWFP AGRICULTURE	723	2.3	516	1.6	676	1.9	463	1.3
15 SIND AGRICULTURE	462	2.4	429	2.2	432	1.6	401	1.4
16 ENGINEERING LAHORE	472	4.0	372	3.1	442	2.9	348	2.3
17 MEHRAN ENGINEERING	1,737	13.2	807	6.1	1,624	10.3	725	4.6
18 NED ENGINEERING	1,927	25.5	660	8.7	1,802	16.6	662	6.1
19 NWFP ENGINEERING	973	5.8	752	4.5	910	4.2	703	3.2
20 ALLAMA IQBAL OPEN UNIV	293	46.6	176	28.0	274	38.7	150	21.2
Average	670	7.2	439	4.4	626	5.7%	407	3.4%
Excluding Open University	690	5.1	453	3.2	645	3.9%	420	2.5%

Note: Each university has a schedule of fees for each faculty and degree program. Aggregate fee figures were obtained for arts and science faculties at the certificate, bachelors, and graduate levels. The averages are unweighted means of these aggregates. Hostel fees are not included.

Table A.15. Total Grants Requested by Universities (millions 1987 constant Rs), 1979-89

	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
1 AZAD JAMMU & KASHMIR			30.424	20.067	22.240	22.302	27.765	27.760	40.100	39.169
2 B. Z. MULTAN	17.697	17.795	41.168	22.452	22.743	22.816	24.267	26.039	29.815	32.434
3 GOMAL UNIVERSITY	32.962	37.947	37.138	26.358	30.014	30.548	30.277	37.056	36.617	40.328
4 ISLAMIA U.BAHAWALPUR	17.210	16.863	23.143	25.564	26.963	26.275	36.612	38.350	41.964	42.338
5 ISLAMIC INTERNATIONAL			23.179	29.310	39.715	65.629	54.517	95.873	58.301	69.957
6 QUAID-I-AZAM UNIV.	44.433	50.740	46.389	43.147	43.127	41.859	37.328	44.449	45.090	46.154
7 SHAH ABDUL LATIF								4.984	22.000	32.440
8 UNIV. OF BALUCHISTAN	33.265	31.573	30.873	36.356	48.037	37.741	34.999	37.730	42.396	40.602
9 UNIVERSITY OF KARACHI	83.723	85.997	61.255	65.178	72.273	84.594	75.783	88.827	99.514	103.206
10 UNIVERSITY OF PESHAWAR	89.099	88.638	75.382	89.401	87.480	71.752	74.501	84.301	90.844	102.575
11 UNIVERSITY OF PUNJAB	98.249	89.956	93.924	91.477	88.574	82.210	83.019	102.060	123.008	151.080
2 UNIVERSITY OF SIND	75.866	76.952	77.680	63.178	97.363	74.826	93.721	107.655	101.550	111.224
3 AGRICULTURE FAISALABAD	70.537	68.150	63.476	73.573	86.238	88.482	77.010	89.529	93.685	107.341
14 NWFP AGRICULTURE			15.971	20.961	19.364	21.562	25.322	25.441	31.032	37.019
15 SIND AGRICULTURE	35.453	31.161	31.188	33.633	36.823	38.341	45.130	47.945	60.710	61.081
16 ENGINEERING LAHORE	70.656	67.632	49.067	51.585	62.057	59.373	73.231	70.603	78.179	84.717
17 MEHRAN ENGINEERING	28.956	25.958	31.504	32.827	42.279	43.418	48.996	48.327	61.484	70.993
18 NED ENGINEERING	31.486	29.007	38.962	26.245	35.358	43.085	53.187	51.307	52.673	60.057
19 NWFP ENGINEERING			15.609	22.018	30.344	25.027	29.193	28.016	33.549	36.458
20 ALLAMA IQBAL OPEN UNIV	32.637	31.583	29.714	29.907	38.783	38.763	36.786	39.460	46.114	50.613
Total	762.230	749.951	816.045	803.237	929.775	918.605	961.643	1095.713	1188.625	1319.784

Table A.16. Grants Disbursed, 1979-89 (millions 1987 constant Rs)

	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
1 AZAD JAMMU & KASHMIR		0.653	11.116	11.522	14.656	15.453	18.658	25.441	27.303	28.562
2 B. Z. MULTAN	11.046	11.138	12.191	12.269	16.925	19.544	21.102	24.368	27.336	28.334
3 GOMAL UNIVERSITY	14.758	19.072	20.226	20.039	23.995	26.602	28.876	31.776	36.599	38.142
4 ISLAMIA U.BAHAWALPUR	10.539	11.334	12.228	12.407	17.314	19.343	21.213	24.551	27.496	29.479
5 ISLAMIC INTERNATIONAL		0.915	16.802	17.278	26.051	33.446	37.095	42.679	52.761	47.327
6 QUAID-I-AZAM UNIV.	27.904	27.411	28.731	28.607	29.683	30.951	33.319	37.559	38.598	44.102
7 SHAH ABDUL LATIF								3.442	18.419	18.379
8 UNIV. OF BALUCHISTAN	19.676	18.004	20.128	21.228	27.163	29.255	31.986	34.579	37.788	40.078
9 UNIVERSITY OF KARACHI	49.931	47.908	50.463	52.569	62.123	62.784	70.424	82.201	85.209	86.567
10 UNIVERSITY OF PESHAWAR	50.411	46.688	38.144	41.122	48.830	52.341	58.752	72.247	77.775	80.057
11 UNIVERSITY OF PUNJAB	60.713	54.622	57.964	56.492	68.019	69.269	82.319	98.384	106.532	109.599
12 UNIVERSITY OF SIND	50.564	46.229	48.654	49.578	57.297	56.624	67.241	82.629	81.451	85.807
13 AGRICULTURE FAISALABAD	48.001	43.789	47.086	45.647	55.589	58.039	65.526	75.836	83.846	85.360
14 NWFP AGRICULTURE		0.439	10.184	13.106	16.078	18.296	19.991	22.907	25.874	27.374
15 SIND AGRICULTURE	18.732	19.072	20.467	19.763	23.883	25.843	31.097	38.165	43.413	46.393
16 ENGINEERING LAHORE	37.882	36.637	39.390	38.016	43.963	46.070	54.420	63.159	68.960	68.875
17 MEHRAN ENGINEERING	18.741	17.393	18.861	20.172	26.692	32.517	34.762	39.906	44.191	44.892
18 NED ENGINEERING	17.859	16.935	18.288	19.011	24.614	26.518	29.517	35.262	37.371	37.744
19 NWFP ENGINEERING		0.710	10.828	12.798	17.195	19.813	22.323	25.513	29.056	29.870
20 ALLAMA IQBAL OPEN UNIV	16.337	16.477	17.318	16.683	18.786	23.190	26.655	29.699	30.994	33.953
Total	453.094	435.429	499.069	508.309	618.856	665.900	755.277	890.303	980.972	1010.894

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